

NOVEMBER
1954

chemical processing

for men who manage

highlights

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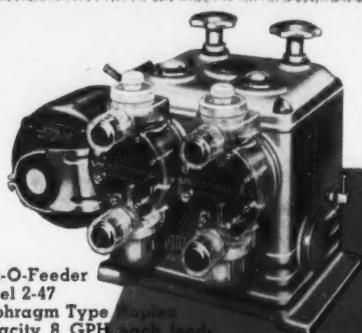
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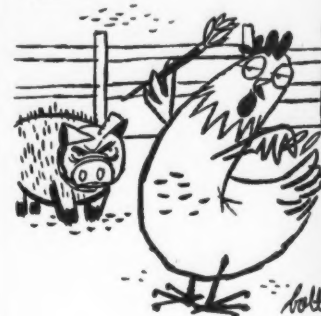
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which can be processed to make paint
brush bristles equal to those plucked
from Chinese hogs (now squealing be-
hind the "bamboo curtain").

Without pepper?

It has been estimated that there is
enough salt (five trillion tons) beneath
the State of Kansas to cover the entire
State to a depth of 37 ft. (*Gould
Battery News*)

Snappy shape

A new look is shaping up for rubber
bands. The B. F. Goodrich Co. has
started to make them round. It is
reported that round bands are easier
to pick up and handle, thus saving
time in using a snappy item.

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chemical processing

(CHEMICAL PROCESSING PREVIEW)

for men who manage

Vol. 17

November, 1954

No. 11

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Over
the editor's
shoulder

The acid test

Who, what, where, when, why, and how? The five "w's" and the "h" are essential questions any well-written story must answer. But getting the answers to these questions is only a part of our job. Equally as important as good writing techniques is the selection and gathering of editorial matter.

The well-thought-out choice of articles in each issue of CHEMICAL PROCESSING is your guarantee of proper editorial balance . . . stories which appeal to a wide reader audience. Behind the scenes, each one has passed a critical evaluation. Is the process, material, or idea new? Does it function efficiently, economically, and with a minimum of maintenance? Can it be adapted to other processes? These and other penetrating questions are asked. After field calls or further study, then—and only then—is the story written.

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Carefully selected and edited articles aid today's hurried readers . . . the men who manage . . . in assimilating news of current and noteworthy developments in a minimum of time. As readers of CHEMICAL PROCESSING, this time saving is your dividend . . . a dividend which we as editors strive to maintain.

Reuben W. Strickland

ASSISTANT EDITOR

THIS MONTH'S COVER

Dr. C. E. Kenneth Mees, father of modern color photography, is this month's Pioneer of Progress. Story of the long, arduous development of difficult laboratory processes to a successful industry, starts on page 10.

Highlights in this Issue

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2. If you are looking for information on specific products, use the Product Directory "Quick-locator" for all types of materials, instruments, processing equipment, etc. This Product Directory lists everything in this issue, with page references 213

3. If you want to subscribe to this magazine, see reader-qualification form opposite page 3



Nov. 1-5. American Welding Society, National Fall Meeting, Sherman Hotel, Chicago, Illinois.

Nov. 1-5. National Metal Exposition, Chicago, Ill.

Nov. 3-5. Twelfth Annual Pittsburgh Diffraction Conference, Mellon Institute, Pittsburgh, Pa.

Nov. 4-5. American Drug Manufacturers Assoc., Production and Engineering Section, Fall Meeting, Brown Hotel, Louisville, Kentucky.

Nov. 7-11. Eastern Sanitary Supply Group, The Industrial Housekeeping Safety Guild, Inc., Annual Convention, Ambassador Hotel, Atlantic City, N. J.

Nov. 10-12. Industrial Management Society, 18th Annual Time and Motion Study and Management Clinic, Hotel Sherman, Chicago, Illinois.

Nov. 15-17. American Standards Association, Fifth National Conference, Hotel Roosevelt, New York City.

Nov. 16-20. Federation of Paint and Varnish Production Clubs, Annual Convention, Palmer House, Chicago, Illinois.

Nov. 17. Western Area Development Conference, Mark Hopkins Hotel, San Francisco, Calif.

Nov. 17. American Society for Testing Materials, Insulating Oil Symposium, Carter Hotel, Cleveland, Ohio.

Nov. 23. Manufacturing Chemists' Association, Winter Conference, Hotel Statler, New York City.

Nov. 29. First International Automation Exposition, 242nd Coast Artillery Armory, New York City.

Another "new look" in CP . . .

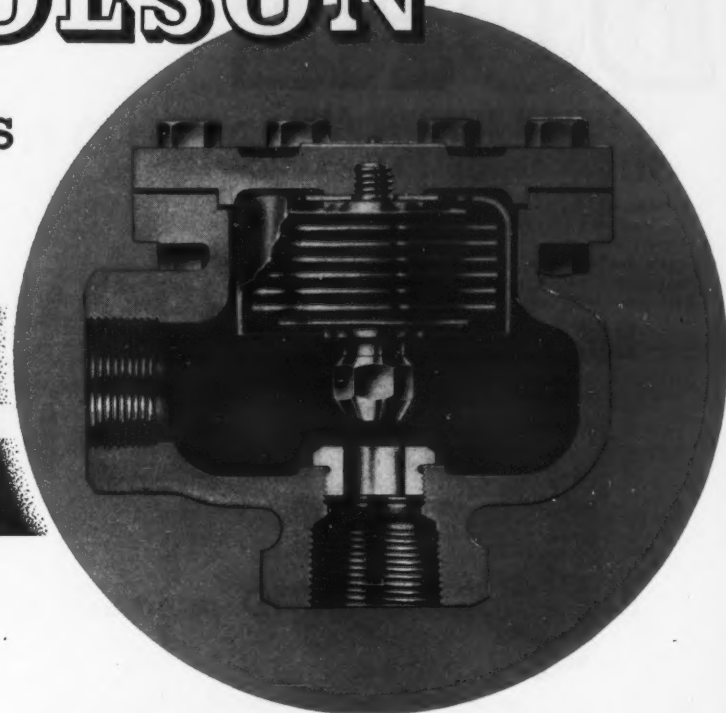
As you read this month's issue, you should find it "easier on the eyes". We've found that adding a little space between the lines of editorial material will make **CHEMICAL PROCESSING** an easier magazine for you to read.

NICHOLSON

Steam Traps
feature

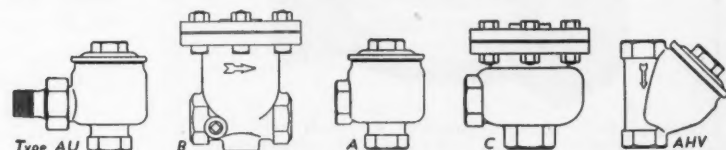
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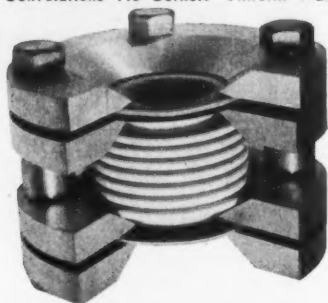
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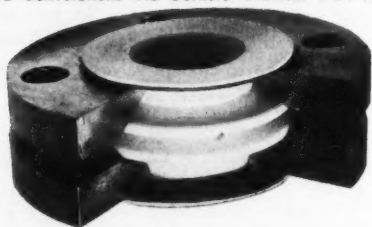


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HARRY D. KOLB, Manager

Employee Communication Division
Esso Standard Oil Company



Mr. Kolb is a graduate of Carnegie Tech and holds a Master's degree from the University of Michigan. His career at Esso started in 1934. In 1946, he was instrumental in reorganizing the training programs at Esso's headquarters. Mr. Kolb served as assistant manager of the Training Division for six years before assuming his present responsibilities.

communication pays off

Specific methods and devices used by any one company to secure a flow of information up and down the organization will vary widely. The real question is to find underlying principles which stimulate communication of this kind.

In a recent study conducted by our company, we found that employees want to know about their own local plant, sales division, or district office. They want some idea of how the economics of their own local unit will affect them and their own security. Out of such knowledge can come cooperation based on understanding. In recognition of this principle, one plant superintendent felt it wise to take his people into his confidence and give them practically every bit of information that was available to him.

This flow of information didn't just suddenly start, nor is it confined to employee forums. This plant has various devices for face-to-face group discussion. One is a periodic conference of all supervisors to exchange ideas on topics from top management. Even more important is a system of weekly staff meetings. One is held by the general superintendent for his department heads. Out of this meeting stems a series of lower-echelon staff meetings conducted by each department head with his own supervisors. These sessions are aimed at securing coordination through the exchange of operating information. They also provide an opportunity to explore other ideas, and send attitudes and ideas up and down the line.

The foreman has a job to do in his own group. His job isn't to sell anything. It's to bring information

to the group on the company's viewpoints and actions. It's to get information from his group as to their ideas and attitudes. He has to relay this information back where it has a chance of influencing the decisions and actions of management.

A good communication system must stem from the belief that employees have a right to hear and a right to be heard. Communication isn't a device to sell, to convert, or to attack, it's a system for an exchange of information. We need to believe in the importance of this exchange.

There are many who say that, despite a great deal of talking about it, business has made little progress in building an upward flow of communication. Perhaps it is in recognition of this that business so often circumvents its normal channels of communication and reaches out for such things as attitude surveys. After all, what is such a survey but a device to give top management information on attitudes and feelings at one particular time on certain specific subjects? Would it not be better to put the effort into improving the upward flow of communication so that management would continue to get day by day a dynamic picture of the attitudes and feelings of its people?

Some companies have made efforts in this direction by bringing employees together in relatively small groups for frank discussion of matters of common interest. This approach has an important place. But it is a somewhat limited means because it occurs as a special occasion and not as a natural process. Such

forums are frequently led by staff members and are not integrated into the line organization communication channels.

The alternative is to develop a basis for regular meetings of small groups of employees with their immediate supervisors. Such meetings demonstrate the leader's interest in his men. They stimulate positive reactions. They promote creative thinking. They provide an opportunity for the individual to ventilate his feelings while going along nevertheless with the majority. They build employee interest in activities of the group. The meeting is an opportunity for sharing and as such builds the feeling of participation so vital to cooperation. Groups accomplish more when they have looked at their goals and problems together and become of a mind to tackle them.

The real problem is to put group meetings of this kind on a regular basis. Management in general shies away from such programs. Many foremen agree that they would like these meetings, but most of them back away from taking the initiative.

What is needed first, then, is the means to develop in middle management some understanding of results that leadership of this type can accomplish. They need to believe in the wisdom of open communication and recognize the importance of the individual's viewpoint and the opportunities for cooperative behavior that spring from participative action. These phrases are accepted mainly as labels applicable to broad company programs. Their pay-off comes when middle management starts finding ways to apply them directly, through their own foremen's actions.

The above is an abstract of an address by Mr. Kolb as presented in the AMA's bimonthly magazine Personnel, May 1954.

You help us decide what articles appear in CP...

Yes, you help to determine just what our editorial pages will contain from month to month. Every article appearing in CHEMICAL PROCESSING must first be "qualified"—that is, judged for its importance and idea value to our readers. In qualifying material, we rely heavily on reader response to related developments gathered in the field and published in the past.

And that's where you come in. Your inquiries tell us what materials, processes, ideas, equipment you want most to read about... and we follow through with articles most suitable to your needs... So when you inquire, you "vote" for "more articles like this".

THE EDITORS

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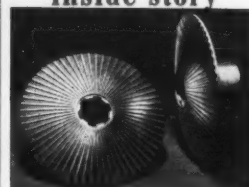
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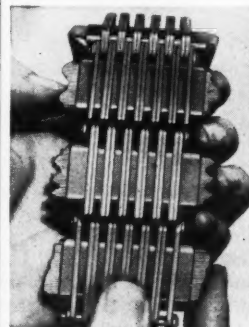
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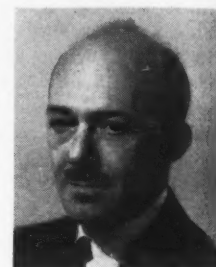


NO SLIPPAGE — HERE'S WHY!
Teeth of the radially grooved wheels (above) are cut at a constant depth but are of increasing width toward the wheel periphery. The sides are beveled to provide gripping areas for the self-tooth-forming chain (below). The chain slats shuffle back and forth between the wheels—mesh fully when they engage.



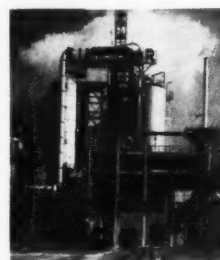
what you can expect in next month's issue . . .

The Battle Against Corrosion



The never-ending problems of corrosion control are of vital importance in chemical and allied industries today, as evidenced by high reader response to articles on the subject. In view of this wide interest, the editors of **CHEMICAL PROCESSING** are preparing extensive material covering corrosion problems to be incorporated into an expanded version of the regular Corrosion section.

The man pictured above — Dr. Aaron Wachter — is one of the country's foremost authorities in the field. His editorial — a penetrating analysis of present corrosion problems and control — leads off our feature section. As President of the National Association of Corrosion Engineers and head of Shell's Materials Engineering and Corrosion Department, Dr. Wachter has been a leading figure in this battle.

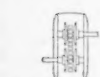


In another corrosion highlight, Chief Technician David Stewart and Associate Editor Gordon Weyermuller ("chief" of our monthly Corrosion Control section) describe Sinclair's successful fight against tube bundle corrosion through use of internally clad aluminum tubes.

(Our December cover pictures the Sinclair plant, a view of which is shown above.)

Reference tables of data, summaries of technical papers by corrosion experts, and many on-the-spot stories of installation problems will round out the section. We hope this feature coverage of corrosion control will provide additional "weapons" in your battle against this enemy.

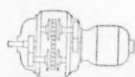
4 of 16 P.I.V. types — 1/2 to 25 hp — ratios to 6:1



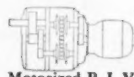
Basic P.I.V. Like all others, it is built for horizontal or vertical mounting.



P.I.V. with single reduction input or output helical gears.



Motorized P.I.V. with single reduction input and output helical gears.



Motorized P.I.V. with double reduction input and output helical gears.

LINK-BELT

THE TRADE OF QUALITY
P.I.V. VARIABLE SPEED DRIVE

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

13,512

When inquiring check CP 3323 on handy form, pgs. 2-3

Transfers heat at 2½ million Btu/hour

Processing Equipment highlight for December explains a high-velocity burner, operating on a jet principle, which mounts on a compact heat exchanger to give a heat transfer rate of 2½ million Btu per hour. The unit measures only 3½ x 3½ x 9½ feet, operates on either gas, light oil, or gas-oil combination.

Here's a quick preview
of features you'll find in
December's Chemical Processing

Salt cake loss, contamination cut by pneumatic handling

National Container Corp.'s new kraft pulp mill at Valdosta, Georgia, is producing 500 tons of pulp per day with completely automatic control. Contributing to the success of its process is a pneumatic conveyor system designed to handle salt cake needed for cooking liquors. The system has cut labor costs and spillage loss, and permits economical bulk purchasing. Story of how the system works is featured in next month's Material Handling section.

Powdered taconite converted to hardened pellets

Allis-Chalmers Research Division, after years of study, has developed a process for converting powdered taconite (low-grade iron ore) into a pellet form suitable for use in blast furnaces. A horizontal "traveling-grate" furnace ignites pellets at 2300-2400°F, causing them to harden. Full-scale unit in operation at Mesabi Range, Minn., now produces 1000 tons per day. Story appears in the Ideas section.

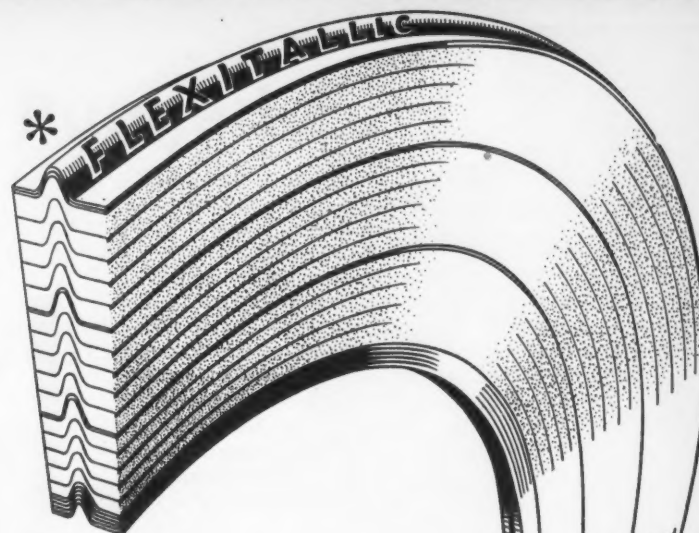


How Sherwin-Williams solved dust collecting problem

In planning to expand beta-naphthol production at its Chicago plant, Sherwin-Williams tackled the old headache of dust collection and came up with a unit which has a collection efficiency of 95%. Assistant Editor Ted F. Meinhold and Sherwin-Williams Chemical Engineer Dr. E. G. Yee describe the unit in next month's "New Solutions" highlight.

And in brief . . .

Another "New Solutions" feature describes a multi-diameter, single shell, horizontal rotary dryer used by New Jersey Menhaden Products, Inc., for more efficient drying of heat-sensitive material. . . Case history tells how technical service helped a textile manufacturer cut production costs by showing him how to make his own resins. . . and many other articles describe ideas, processes, and services in all our regular sections.



FINDING THE ONE RIGHT GASKET

Because there are so many ways to go wrong in selecting the proper seal when fluids are confined at pressures to 4,000 lbs. . .

Because exact performance data is essential when choosing a gasket to confine fluids at temperatures up to 2000° F. . .

Engineers come to the Flexitallic "storehouse" of gasket experience on important sealing assignments. Here is performance data on Flexitallic Spiral-Wound Gaskets in thousands of applications, under the most difficult sealing conditions . . . more than 40 years of finding the right gasket for the right flange to make the proper seal.

Flexitallic Spiral-Wound Gaskets, with their uniquely resilient construction, offer the basic advantages of low seating stress and low bolt stress.

Each Flexitallic Gasket is engineered to meet specific conditions

of thermal and physical shock, corrosion, vibration, weaving and unpredictable joint stresses. Spirally-wound V-crimped plies of required metal with alternating plies of proper filler results in a resilient gasket having characteristics of a calibrated spring.

Flexitallic Gaskets are at highest efficiency when bolted up cold at a predetermined load. For all pressure/temperature ranges from vacuum to 10,000 lbs., from extreme sub-zero to 2000° F. For all standard joint assemblies. In four thicknesses for special requirements: .125", .175", .250", .285". In diameters to 84" O. D.

FLEXITALLIC GASKET CO.
8th & Bailey Sts., Camden 2, N. J.
Representatives in principal cities

Flexitallic
SPIRAL-WOUND GASKETS

FOR PIPE FLANGES, PRESSURE VESSELS AND PROCESS EQUIPMENT

**TEFLON FOR
PROCESS APPLICATIONS**

The ideal seal for many process applications is a Flexitallic Gasket with Teflon trapped between edges of stainless steel. Ask for folder, "Teflon in Flexitallic Gaskets."

*Not all spiral-wound gaskets are Flexitallic. Look for the name FLEXITALLIC stamped into the metal spiral of every genuine Flexitallic Gasket. Look for Flexitallic Blue — it's our exclusive blue-dyed Canadian asbestos filler.

When inquiring check CP 3324 on handy form, pgs. 2-3

Rembrandt spent two months, more or less, in painting a scene or portrait. If you are an average amateur photographer you can shoot a picture in color in two minutes — the actual picture-taking accomplished in a fraction of a second.

Behind this apparent simplicity lie years of hard and frustrating work. Only the exceptional determination of the technical people of Eastman Kodak has made practical . . .

capturing color on film



By thinking and working steadily to make photography available to everyone, everywhere, the Eastman Kodak Company has reduced picture taking to a simple routine . . . as easy as turning on a light or starting a car. But, like an iceberg, most of the ponderous work involved in picture-making is done out of sight. There's more to it than button pressing.

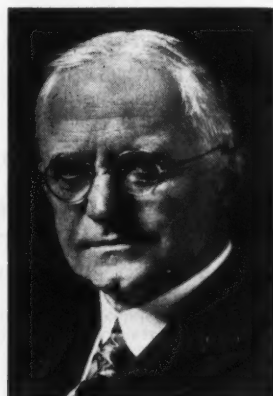
When a cartridge of exposed Kodachrome film is returned to the laboratory for developing it goes through 15 processing steps involving eight separate chemical baths. Six of these are as critical as a brain

operation. Temperature throughout the process is held to 0.1°C, pH to 0.05 units. Wear in the bearings of agitators can change processing results. Even weather vagaries that might bring the debris of an atomic explosion across thousands of miles to Rochester, N. Y., have to be checked. And all of this precaution is necessary just for the job of processing the exposed film . . . *making it is the hardest part!*

Eastman Kodak's Kodachrome has been a growing commercial product since 1935. Before that there were color photographic processes, but not on the

same scale. Color photos have been in existence since at least 1877, but even in the '20's a good 15" x 18" portrait might have cost \$1000. A far reach from today's situation where anyone with a reasonably good camera could have a color enlargement made for less than \$10.

Prior to 1935, Dr. C. E. Kenneth Mees and his colleagues of Eastman, working with two amateurs, Leopold Mannes and Leopold Godowsky, Jr., well known as musicians, had made repeated attempts to invent a color film which would produce a picture



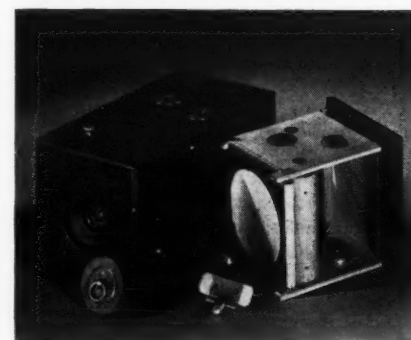
Seventy-five
years
ago . . .

Seventy-five years ago, George Eastman (above) started his pioneering work in photography. This work continues today. Eastman's problems, while less complicated technically, dealt with wholly unexplored methods.

His first taste of photography was the wet plate technique — shown here (woodcut) in use by amateurs of the 1870's. Glass plates were coated and sensitized on the spot so that they could be used while still wet. The first Kodak camera (right) changed an esoteric hobby into an industry. It was sold loaded with 100 exposures of roll film. When these were shot up, the user returned the



camera to Rochester for developing, printing . . . and reloading. There was more fact than jingle in the slogan "You press the button, we do the rest" in those days. From George Eastman's kitchen, Kodak film production moved to sprawling Kodak Park, still growing in Rochester. Plants for photographic supplies have sprung up across the US. Kodachrome laboratories have been established



without separate negatives, dye transfer, image splitting, or any of the other tricks employed earlier. Their work was based upon a film "sandwich" with three layers, each sensitive to blue, red or green light.

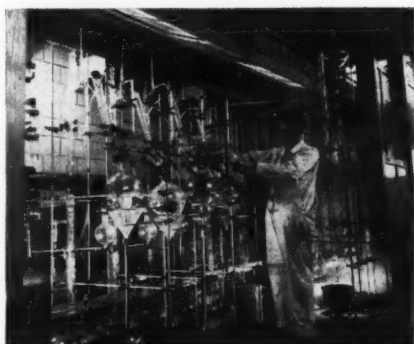
Assorted Imps and Devils

There was nothing wrong with the theory. But imps, devils, and diverse troubles plagued those who tried to apply that theory. An ordinary photographic emulsion is sensitive to blue light which it renders in black and white — as the familiar negative. Certain dyes (sensitizers) could be added to the silver halide — the light-sensitive material itself — to make it respond to red light or green light. But it still responded to blue light, too. Because of this continued "allegiance" to blue light, the red and green-sensitive layers had to be shielded from blue light. This shield or filter, of course, could not interfere with the blue light striking the blue-sensitive layer.

All this was realized and taken care of in the twenties. A multilayer film was "built" so that light first passed through a blue-sensitive layer, then through a yellow filter to knock out blue. It then went through the green- and red-sensitive layers. Each layer had to be within about 5% of its specification thickness (about 0.00015 inches), contain the proper amount of silver halide and have the proper "speed" or sensitivity. Alice, with her flamingo-croquet mallet and hedgehog ball, might have felt right at home with these problems. As problems, though, they were only very difficult, not impossible.

In one of the first attempts to produce a multilayer film, Dr. Mees sent one of the youngsters of the organization, Dr. Cyril J. Staud (now Director of Research Laboratories) to the film coating department.

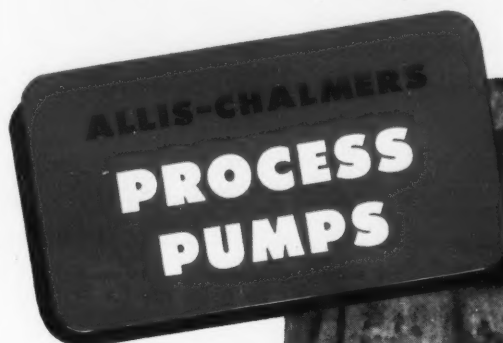
(Continued on page 211)



in Harrow, England and Vincennes, France. Technical facilities of the first rank are in service finding better photographic means (above). And more than sixty times a second a camera shutter clicks somewhere in the world, for we are now taking two billion pictures a year.

In Two Years' Rugged Duty

"Never Down for Maintenance"



**A-C Pump runs 4 times longer than previous unit
...and still going strong**

A LARGE EASTERN CHEMICAL COMPANY is using Allis-Chalmers 4 x 3 PDE process pumps with *Equeiseal* stuffing boxes to handle phosphoric acid water containing abrasives. These pumps operate 24 hours a day, 7 days a week. The unit shown above has been in use for approximately two years and has never been shut down for maintenance. The pumps previously used had to be completely reworked every six months and re-packed every three weeks. Naturally, maintenance costs have been drastically reduced.

Allis-Chalmers process pumps are available with or without *Equeiseal* stuffing box, in a wide choice of materials to handle many types of abrasive or corrosive material at temperatures to 250° F. Every pump is individually engineered to each application. For details, contact your A-C representative or write Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for Bulletin 52B6615.

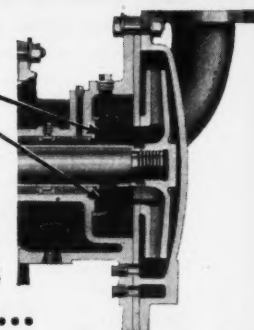
Equeiseal is an Allis-Chalmers trademark.

A-4395



Why

this A-C feature prevents leakage...



Many A-C process pumps have the *Equeiseal* stuffing box. This is an auxiliary impeller which produces a low pressure area in front of the packing. This low pressure area prevents the liquid being pumped from entering the packing (on suction heads to 15 feet at 1,750 rpm). Equipped with an *Equeiseal* stuffing box, an A-C pump will actually run without packing.

ALLIS-CHALMERS



When inquiring check CP 3325 on handy form, pgs. 2-3

V. W. TOBEY, Superintendent
Kyanize Paints, Inc.
with **GORDON WEYERMULLER**, Associate Editor

**While permitting fine control
of flats and semi-glosses —**

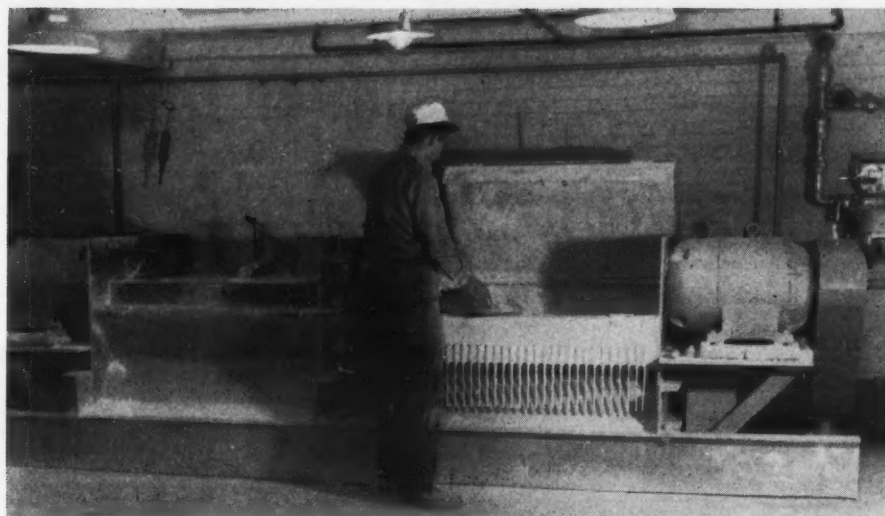


Fig 1—Operator adds pigment to one tank of horizontal mixer used at Kyanize Paints

semi-continuous process boosts paint production

**Good shearing action of heavy-duty
horizontal mixer plus mill equipped with
Carborundum stones eliminates roller milling**

Problem: Conventional paint equipment used in manufacturing a flat wall finish at Kyanize Paints Inc., of Everett, Mass., failed to meet demands for increased production. Pigments and vehicles were delivered manually, while roller

milling was required for uniform color dispersion. Improved process was needed to replace the batch operation.

Solution: Company placed a semi-continuous paint process in operation in January of 1952, views of which appear in accompanying photographs. Heart of the continuous process is the twin horizontal mixing unit shown in operation in Fig 1. This unit has two 250-gal mixing tanks which are agitated by independently-driven beaters.

Fig 2 illustrates the shearing action obtained with the heavy-duty blades.

High-viscosity alkyd resin is transferred to weighing tank from storage tank in basement by means of a Moyno pump. (This operation was covered in detail in the May issue of *CHEMICAL PROCESSING*, pages 148-149.) Second Moyno pump is used for transferring correct amount of vehicle from weighing tank to mixer. View of Toledo floor scale with weighing tank behind it is shown in Fig 3.

Bowser positive-displacement metering device, illustrated in Fig 4, accurately measures solvents to be added to mixer from storage tank. Pigments are delivered to mixing equipment on pallets.

After leaving mixer, paste passes to Morehouse

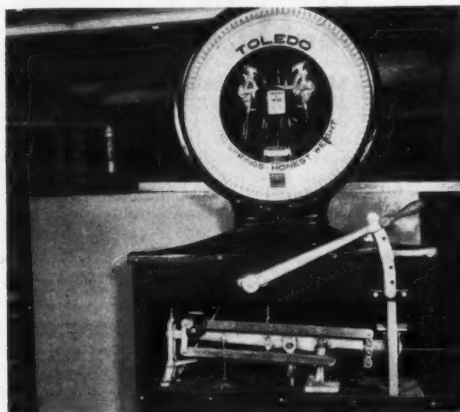


Fig 3—Vehicle is transferred from storage in basement to weighing tank through pipe at left

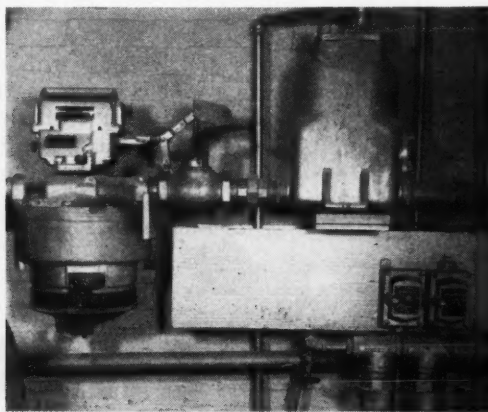


Fig. 4—Solvents are accurately added to mixer through positive-displacement metering device



Fig 5—Operator checks paste coming from mill, located directly beneath horizontal mixer

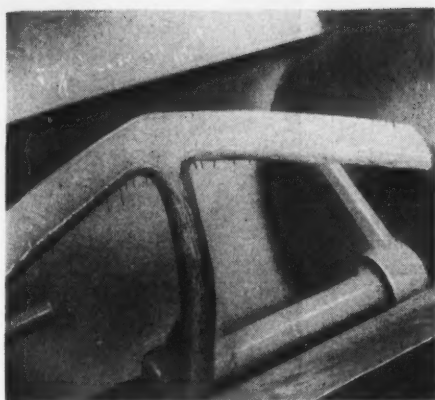


Fig 2—Heavy duty blades provide excellent shearing action, permit mixer to handle a heavy paste

stone mill equipped with Carborundum stones immediately below, Fig. 5. This mill completes the grinding and dispersion of the pigment. Material is then transferred by gravity to 1100-gal reducing and tinting tank on floor below. Additional vehicle is added at this point to form finished product, which is delivered to containers through filling equipment.

Results: Semi-continuous paint process has increased production greatly over previous batch procedure. Approximately 13,000 lb of paste per eight-hour day passes through mixer and mill. This is diluted with additional vehicle to form 27,000 lb or 2200 gal of finished product per day.

In addition to the higher production, process has assured a uniform product of high quality. Flat wall finish, known as Clingcote, is based on manufacturer's own odorless alkyd resin. Paint has early hardness, resistance to washing (300 cycles with Lava soap), as well as abrasion-resistance.

Uniformity of pigment dispersion is obtained without roller milling. This is due partly to use of the horizontal mixer, which can handle a heavy mix and has excellent shearing action. Morehouse stone mill is also a large factor in the fine pigment dispersion. No maintenance has been required on either of these two units, nor on any of the other equipment since placed in operation. All that is necessary is to oil the mixer and change the stones on the mill every 60,000 to 70,000 gal of paste processed.

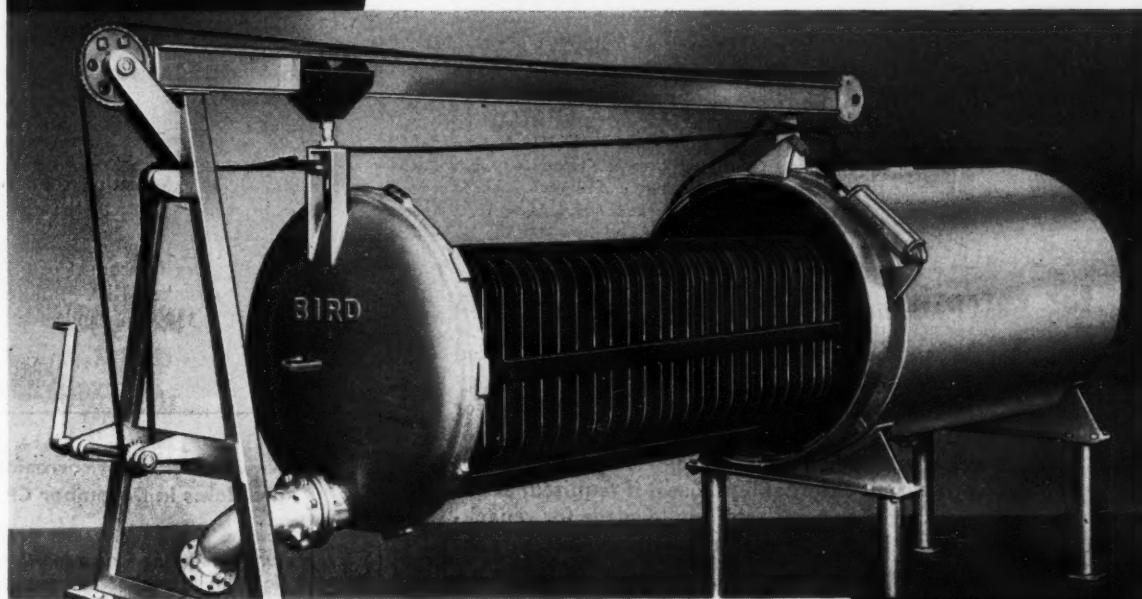
Another advantage of the process is considerable savings in labor. Process is essentially a three-man operation, including one man for tinting. In addition, three men are used for filling finished product.

(Model 250D twin horizontal mixing unit is manufactured by National Rubber Machinery Company, Dept. CP, 47 W. Exchange St., Akron, Ohio . . . or check CP 3326 on handy form, pages 2 and 3.)

(Carborundum stone mill is product of Morehouse Industries, Dept. CP, 1150 San Fernando Rd., Los Angeles 65, Calif. Check CP 3326A, pages 2 and 3.)

WHY THIS BIRD PRESSURE FILTER IS SEVEN WAYS BETTER

- 1. Engineered by Experts.** The Bird Pressure Filter is the outcome of years of pressure filter design and application experience plus unsurpassed manufacturing, research and testing resources. It is custom built to your product, process and volume needs.
- 2. Higher Working Pressures.** Pressures up to 75 psi are standard, with special models available up to 250 psi. Faster, more thorough filtration is the result.
- 3. Safe, Leak-Proof Operation.** The head gasketing is of new and advanced design. Clean operation without product contamination is assured.
- 4. Improved Leaf Design.** The specially shaped and constructed leaves of the Bird Pressure Filter provide maximum strength, maximum sustained filtering area, high rate of flow, quick cleanability and quick removal and replacement. A new leaf spacer design assures positive and permanent leaf alignment.
- 5. Removable Filtrate Manifold** of radically improved design permits adjustment of leaf centers and balanced distribution of slurry to filter leaves.
- 6. Drier Solids, Brilliant Filtrates.** Extraordinarily thorough separation is inherent in the design of Bird filter leaves, with no chance of feed slurry contaminating filtrate.
- 7. Rapid, Thorough Cleaning.** A single operator can run and clean several Bird Pressure Filters. All parts of the filter interior are easy to get at.

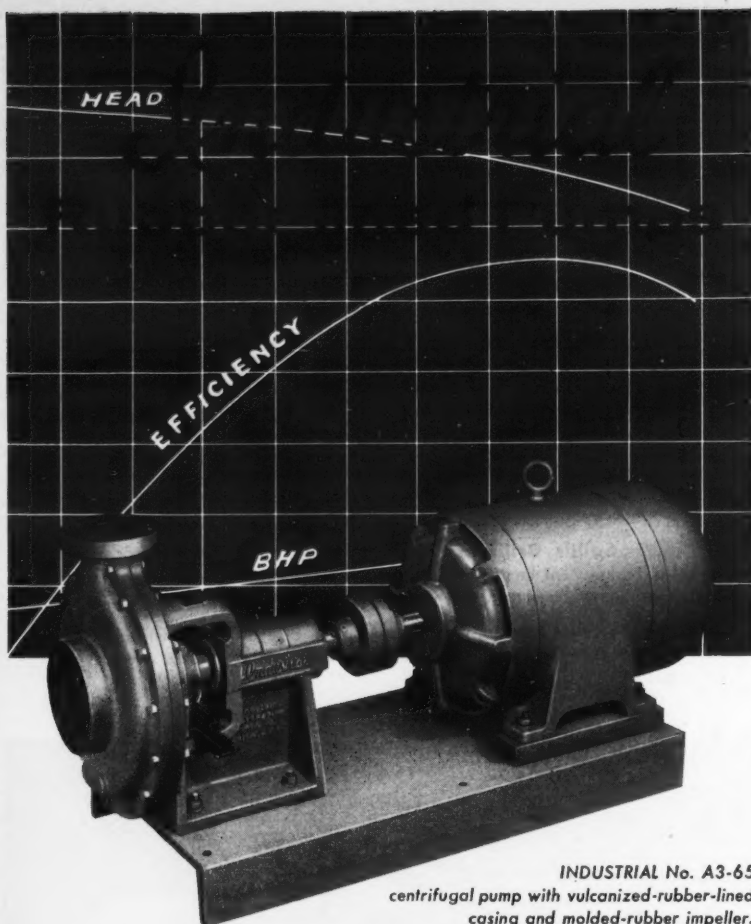


The Bird Research and Development Center is set up to provide the facts and figures showing that the Bird Pressure Filter is the most efficient and economical for your purpose. Findings and recommendations will be unbiased because Bird builds all types of solids-liquids separating equipment.

BIRD MACHINE COMPANY • South Walpole, Mass.

When inquiring check CP 3327 on handy form, pgs. 2-3

**AND
HOW WE
CAN
PROVE IT**



INDUSTRIAL No. A3-65
centrifugal pump with vulcanized-rubber-lined
casing and molded-rubber impeller.
Base has rubber-covered floor.

for corrosive and noncorrosive liquids

The latest in pump engineering and design is incorporated in INDUSTRIAL centrifugal pumps for maximum efficiency and severe, continuous service. Lined with soft rubber for abrasive slurries or hard rubber as specified, balanced rotating assembly mounted in ball bearings, corrosion-proof stuffing box to permit external liquid seal if required, easily removable packing gland nut and ample space for repacking stuffing box, simple adjustment of impeller clearance are some of the features.

These pumps are made in a range of sizes with capacities up to 240 gpm., operating heads up to 240 feet, and $\frac{3}{4}$ to 15 hp. They are furnished either with or without base, motor, and coupling

Complete Information on Request

5150

INDUSTRIAL
FILTER & PUMP MFG. CO.

5908 Ogden Avenue • Chicago 50, Illinois

PRESSURE FILTERS
ION EXCHANGERS
RUBBER LININGS
HEAT EXCHANGERS
CENTRIFUGAL PUMPS

When inquiring check CP 3328 on handy form, pgs. 2-3

NEW SOLUTIONS of processing problems

Alcoa uses asphaltic coating to eliminate condensation on pneumatic tubes . . .

also has worked successfully on water pipes
and air conditioning ducts

Problem: The Massena, N. Y., plant of Aluminum Company of America had considerable trouble with condensation forming on pneumatic tube systems. Plant has two tube systems, one a pressure system (7200 ft one way) and the other a vacuum system (1500 ft one way). Lines run both indoors and outdoors. Condensation formed on the exterior of the indoor tubing.

Solution: During the latter part of 1950 company purchased 250 gal of NoDrip asphaltic coating for application to the pneumatic tube systems. Coating consists of an emulsified Mid-continent asphalt, using a hydrophilic colloid as an emulsifying agent.

Since this application worked out successfully, 10 additional gal of the coating was obtained for covering pipes in the basement of the main office.

Later 275 gal of the material was purchased for covering water pipes in the plant. Coating has also been used to prevent the formation of condensate on air conditioning ducts. Plant has applied coating by brush, spray, and trowel. In all cases troweling seems to have worked out the best.

Results: Asphaltic coating has worked out very successfully in eliminating condensation wherever it was used, according to the engineers who have worked with it.

(NoDrip coating is product of J. W. Mortell Co., Dept. CP, Kankakee, Ill. . . or for more information check CP 3329 on handy form, pages 2 & 3.)

New Solutions of corrosion problems in December CP

If you have corrosion problems, be sure to see the Corrosion Control Highlight in December CP. The section will be expanded to include a number of performance stories telling how other plants have stopped corrosion.

Among these New Solution stories will be one telling how cathodic protection has eliminated tank bottom failures in a Texas terminal. Another feature describes how plastic pipe resists hot hydrochloric acid in a plant manufacturing monosodium glutamate.

These stories — and many more — make this one issue you just can't miss!

AIRCO GASES

HYDROGEN
OXYGEN
XENON
ARGON
KRYPTON
NITROGEN
LIQUID NITROGEN
HELIUM

Airco gases and liquids . . .
rare gas mixtures . . . xenon
. . . krypton . . . and neon conform to specification. You can count on their purity and consistent uniformity — every shipment packaged to your requirement!



Consult your
nearest Airco
office for complete
information.

AIR REDUCTION

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Divisions of Air Reduction Company, Incorporated,
with offices and dealers in most principal cities

Air Reduction Sales Company
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Represented Internationally by
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Foreign Subsidiaries: Air Reduction Canada Ltd.
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at the frontiers of progress
you'll find

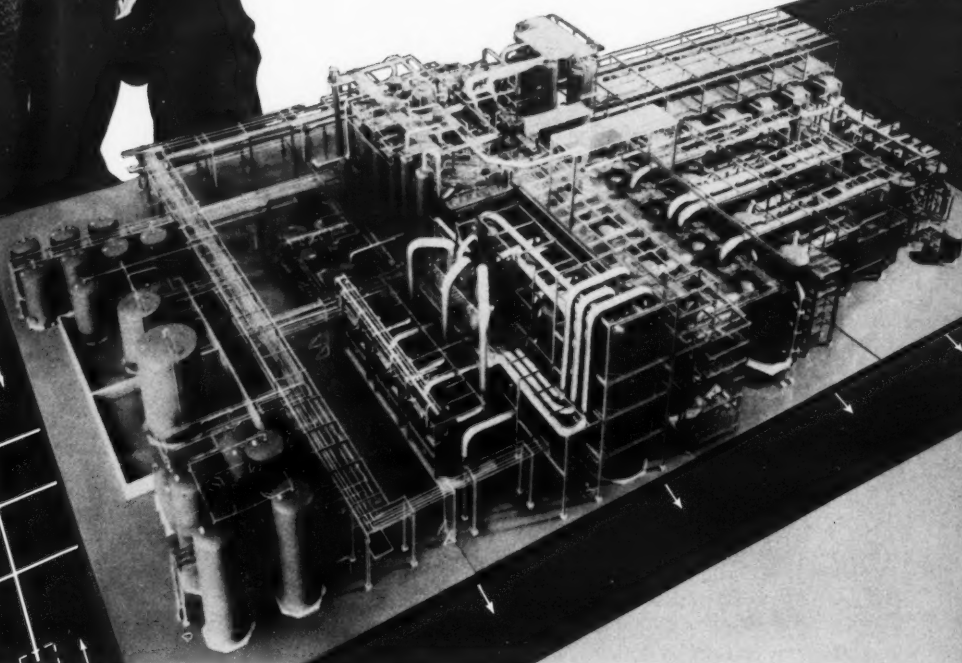


When inquiring check CP 3330
on handy form, pgs. 2-3

CHEMICAL PROCESSING

Is your electrical system as good as your process?

Mr. J. Z. Linsenmeyer, Engineering Manager,
Chemical and Petroleum Industries,
Westinghouse Electric Corporation.



THESE ARE IMPORTANT TO YOUR PROCESS

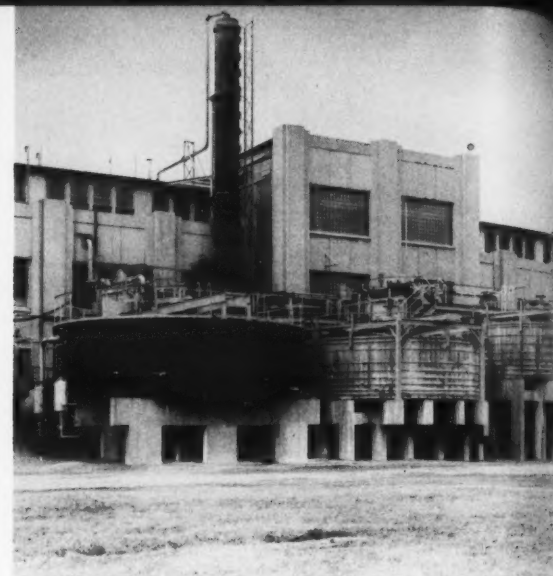
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| How you can meet the needs of constant throughput: | |
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| Power Centers | 5, 7 |
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| Capacitors | 4, 8 |
| Westinghouse can help you line up primary and secondary power | 8 |

YOU CAN BE **SURE**... IF IT'S
Westinghouse





This plant, producing chlorine, caustic soda and other chemicals, is served from front to back door with a complete Westinghouse power generation, distribution and utilization system. A secondary distribution system of the selective radial type protects this operation against thousand-dollar-a-minute down time.



American Cyanamid engineers and Westinghouse worked out a system that will pay dividends for a long time to come. The answer was in providing a group of power centers that can be quickly and easily expanded into a secondary network system as new buildings planned are put in place. Here's Westinghouse equipment matched with a plan for expansion.

Westinghouse, in cooperation with Intermountain Chemical Co., Westvaco Division, Food Machinery Corp., developed here a complete power distribution system, providing benefits not only of an integrated arrangement, but of one company responsibility for design, manufacture and application of equipment.



YOU CAN BE SURE...IF IT'S

Westinghouse can help you match planning with equipment . . .

to bring your distribution system up to par

Early and thorough planning of your power distribution system is the only effective answer to these three basic questions:

1. Will my electrical system be adaptable to changing load conditions with minimum service interruptions?
2. Since down time is very costly, will I get maximum reliability?
3. Can I get good voltage regulation in spite of load fluctuations?

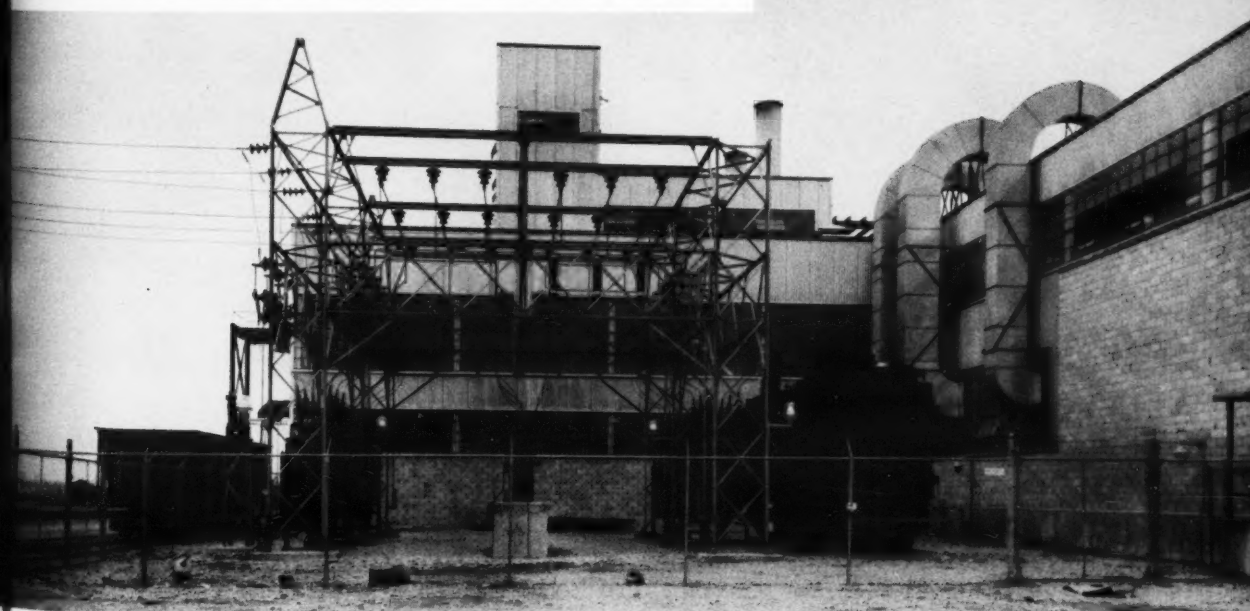
There are many fine electrical systems that can be adapted to fit your process requirements. One modern way to support heavy production schedules is with the network system. This system provides alternate power routes when trouble occurs, so that faults on the line can be shared throughout the system, without down time—a kind of electrical insurance.

But, regardless of the system selected, plan it early, and well, along with process-line planning. Your Westinghouse Representative is ready to assist you. He'll make available to you not only the right equipment, but also the engineering services you need to get started on the right foot.

**These chemical plants integrated secondary power
for more efficient, dependable production**



Outdoor substation by Westinghouse services the entire chemical plant.



Westinghouse

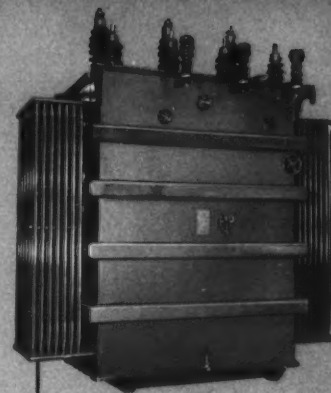


Westinghouse coordinated distribution equipment maintains constant throughput

It's not good business to gamble against power failure when the penalties run high on continuous process lines. And there *are* ways of providing maximum reliability, without stand-by diesel-generator sets or other expensive makeshift arrangements.

This choice of types of equipment and the kind of power distribution layout will depend on the problems in your plant—change-over, expansions, modernization, new processes or products, and so on. Westinghouse can help you select the right equipment and coordinate it to bring out the specific advantages that best suit your requirements.

On these pages are shown several of the major product elements of a typical process power distribution system, and what each can contribute to its over-all effectiveness.

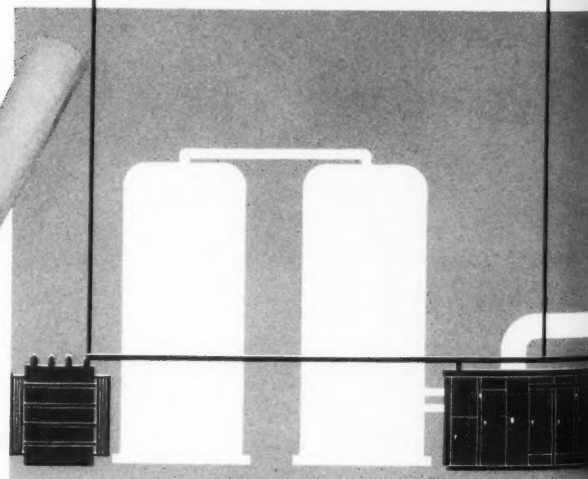


Standardized Type SL Transformers

Liquid-Filled Westinghouse Type SL Distribution or Power transformers for chemical use offer the many economies of standardization, plus design advantages based on years of tested and proved experience.

Capacitors

Large Metal Enclosed Westinghouse Capacitor Equipment provides important cost savings, by improving voltage regulation and reducing ampere loading on circuits and transformers. For indoor or outdoor use, these capacitors are rated 230 to 13,800 volts.



YOU CAN BE **SURE**...IF IT'S

W



Metal-clad Switchgear

To protect heavy capital investment and prevent costly interruption of chemical processes, switchgear must be exceptionally reliable. Westinghouse Metal-Clad Switchgear more than meets this basic requirement—offers outstanding advantages for chemical service.

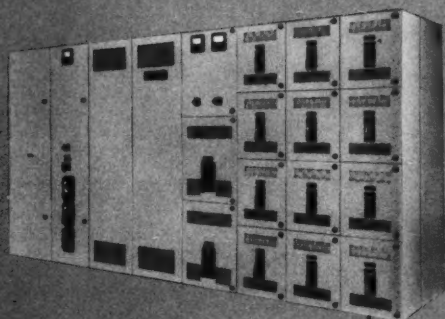
DH Air Circuit Breakers provide positive protection—employ De-ion® arc extinction, the most effective method known. There's less contact burning—less maintenance—more reliability. Breakers draw out horizontally—can be changed in three minutes flat, vital for service continuity.

Corrosion is licked by Bonderizing enclosures *after* assembly—prime and finish painting. For outdoor service, undersurfaces are protected by an all-weather coating.

Standardization in manufacturing keeps your costs down. Special engineering is eliminated. Switchgear can be expanded, re-arranged or relocated with only minor wiring changes and no loss in value.

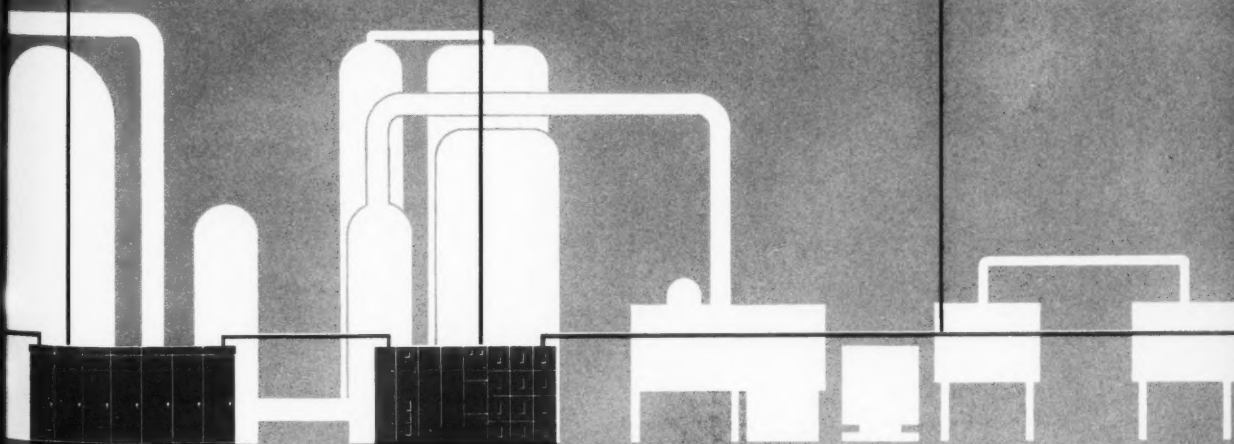
Dry-type Power Centers

Westinghouse Dry-Type Power Centers include in one line-up an air-cooled power transformer, high and low voltage switchgear equipment—all coordinated and tested at the factory for highest operating efficiency. Since all parts are of Westinghouse manufacture, you receive the plus benefits of unit responsibility.



Bus Duct

Bus duct is the modern, convenient way of carrying power in both distribution and utilization loads over long or short runs. Four types provide for economical and efficient handling of power under all conditions, indoors and out.

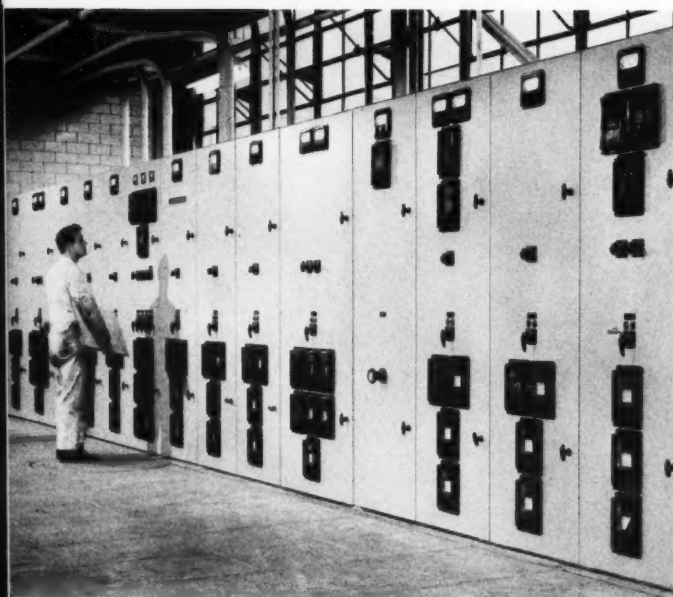
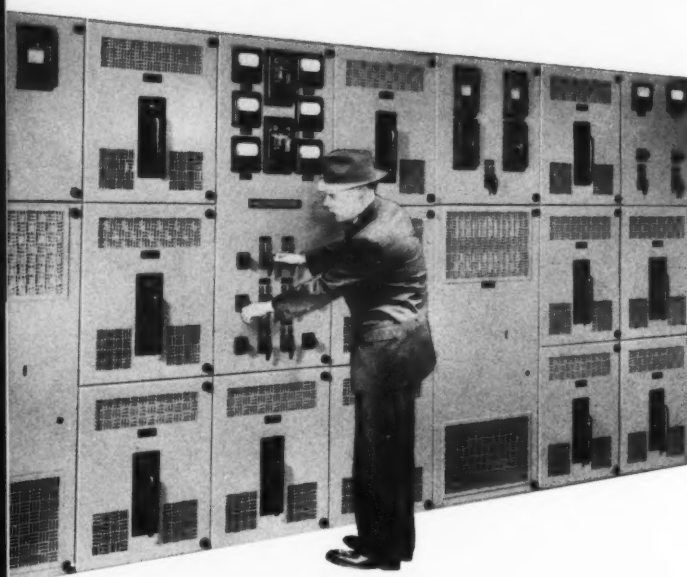


Westinghouse



EQUIPMENT FOR SPECIAL PROCESS
NEEDS ON THE FOLLOWING PAGES.

Westinghouse equipment flexibility meets problems of



... special servicing, with Westinghouse Low-Voltage Switchgear

One basic problem is obsolescence, not only of production equipment, but of the arrangement of power serving that equipment. Here are three outstanding advantages of Westinghouse Low-Voltage, Metal-Enclosed Switchgear to help you in this servicing problem.

1. **Unitized design eliminates special design and engineering expense for the original installation and, at the same time, provides custom-built preciseness in meeting application requirements — number and rating of breakers; selection of attachments, instruments and relays.**
2. **With 10 basic units and a selection of standard instrument panels, future additions or replacements can be easily and quickly made any time.**
3. **All breakers are of drawout type and can be moved from "connected" to "test" or "disconnected" positions, or removed completely.**

... special safety requirements, with Westinghouse High-Voltage Switchgear

Westinghouse High-Voltage Switchgear is completely dead-front. All breakers may be closed or tripped without opening doors or otherwise exposing live parts. Each breaker is enclosed in an individual metal compartment. Interlocks are provided so that the compartment door cannot be opened while the circuit breaker is closed. Bare buses, cable connections and instrument transformers are placed in full-height rear compartments and separated from breaker compartments. Interlock and positioning devices assure safe removal or replacement of breakers.

As added protection, Westinghouse Switchgear structures are completely Bonderized after fabrication, inhibiting corrosion and assuring a long-lived finish.

YOU CAN BE **SURE**...IF IT'S **Westinghouse**



... especially designed capacity, with Westinghouse Power Centers

Dry-type power centers, capable of being installed in the center of your load area, give you all the advantages of high voltage close to the load. For instance you will gain:

Greater Safety—Because of their inherent design which eliminates the need for oil, Westinghouse Dry-Type Power Centers are safe from explosion. No vaults or safety barriers are necessary.

Lower Line Loss—By installing a Westinghouse Power Center in the center of your load area, you eliminate the need for long secondary lines and their resulting power losses. A loss of only 10% of rated voltage can cut furnace heat generation, for instance, to 81% of normal.

Improved Regulation—Voltage drop on power lines to motors causes low starting torque and increased heating, lessening their efficiency and shortening service life. Westinghouse Dry-Type Power Centers help minimize operating voltage drop and assure good regulation.

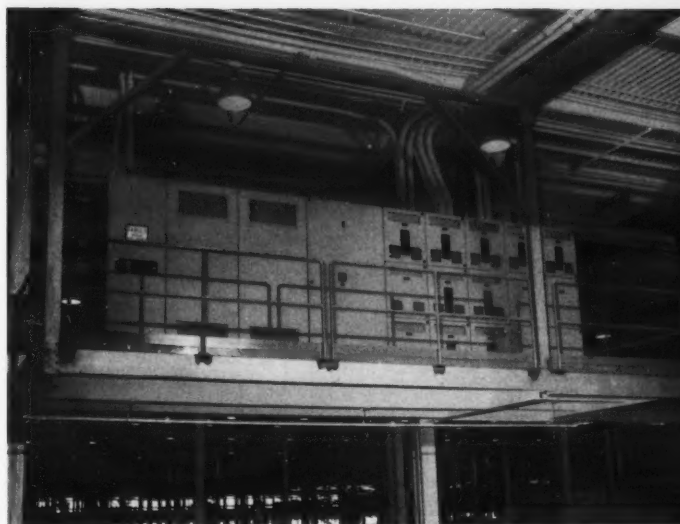
Lower Secondary Cable Costs—Shorter secondary lines mean substantial savings in copper. Realizing these savings throughout an entire plant distribution system can reduce over-all investment considerably.

Power centers include transformer and switchgear in one compact structure.

... especially designed spaces, with Westinghouse Bus Duct and Dry-Type Transformers

Westinghouse Bus Duct is an ideal power distribution medium, because of its universal flexibility. It can be installed quickly and easily to suit physical space needs of your plant. Duct is available in 10-foot prefabricated sections with elbows, tees and crossovers, so that the line can be run in any direction, around obstructions and corners. It can be placed flat or endwise, in batteries or singly, against ceilings or walls, parallel with air-conditioning duct or other lines—and with complete safety. Tight layouts and obstacles are no problem.

In modernization or conversion work, duct is fully salvageable. It can be dismantled, reassembled, expanded—no expensive altering or moving of structures and equipment often necessary with con-



duit-cable systems. Specify flexible Westinghouse Bus Duct.

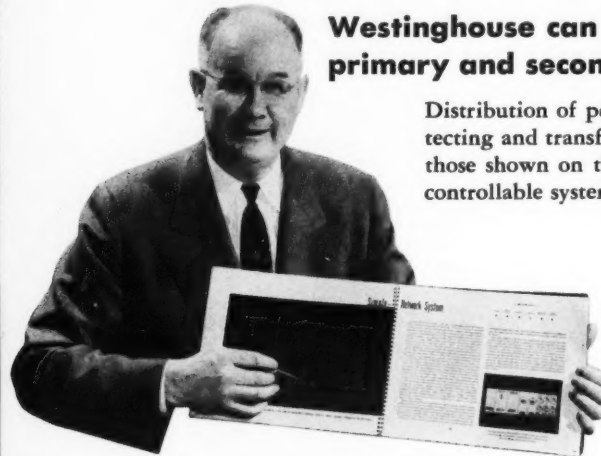
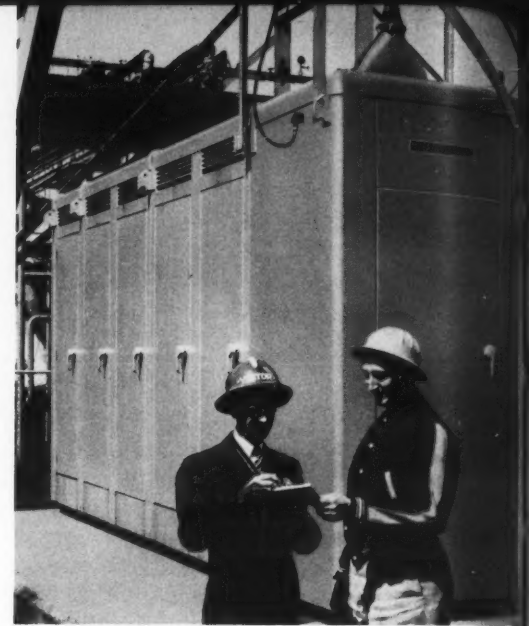
In the picture above, underneath the bus duct, is a Westinghouse AVR Dry-Type Transformer. Placed strategically throughout a plant, these transformers bring power conveniently, economically close to the load. Basically simple, dry types contain no liquids to change and are therefore easy to maintain, safe from explosion.

Large metal-enclosed capacitor equipments control voltage levels

Today, in many chemical plants, large amounts of kilovars are needed to provide voltages at levels required for efficient operation of process equipment and maintenance of product quality.

Westinghouse Inerteen® Capacitors are the ideal source of these kilovars. Capacitors are low in initial cost, require less maintenance than other methods and save additional investment in transformer capacity.

For these applications, Westinghouse offers metal-enclosed capacitor equipments—capacitors, fuses, busbars, connections, switches and accessories enclosed in safe, weatherproof, metal housings. Averaging less than \$8.00 per kvar, these units are standardized in design and factory assembled—save engineering and installation expenses.



Westinghouse can help you match up primary and secondary power

Distribution of power includes carrying, controlling, regulating, measuring, protecting and transforming electrical energy. Many pieces of equipment, other than those shown on these pages, must be considered in planning a flexible, reliable, controllable system. Your Westinghouse Representative can help you select them, coordinate them and tie them in with your primary power.

When you are planning on building, expanding or modernizing, call your local Westinghouse Office. We can offer you a complete line of electrical equipment, specifically designed for processing plants.

MP-3009

Mr. Perry Croco, Consulting & Application Manager, Central Region, Westinghouse Electric Corporation.

Westinghouse maintenance service is nationwide

When repairs are needed, they can be made quickly and properly in any of 38 well-equipped apparatus Repair Shops spotted across the nation. Engineers, operating out of 56 Field Offices, are always ready to provide periodic inspections.

Fast delivery of genuine Westinghouse Renewal Parts from stock in 31 locations enables you to keep low parts inventories at your plant.

Check literature desired and send to Westinghouse Electric Corporation, 3 Gateway Center, P.O. Box 868, Pittsburgh 30, Pa.

Name _____

Firm _____

Address _____ City _____ State _____

- | | |
|--|--|
| <input type="checkbox"/> Network Selector Card | <input type="checkbox"/> Heavy-Duty, Metal-Clad Switchgear B-5306A |
| <input type="checkbox"/> Power Centers B-4162 | <input type="checkbox"/> Capacitors B-3966A |
| <input type="checkbox"/> Transformers That Cut Distribution Cost B-4249A | <input type="checkbox"/> Bus Duct Manual B-4272B |

YOU CAN BE SURE...IF IT'S
Westinghouse



**Prevents "freeze in" of wort,
other liquids being cooled . . .**

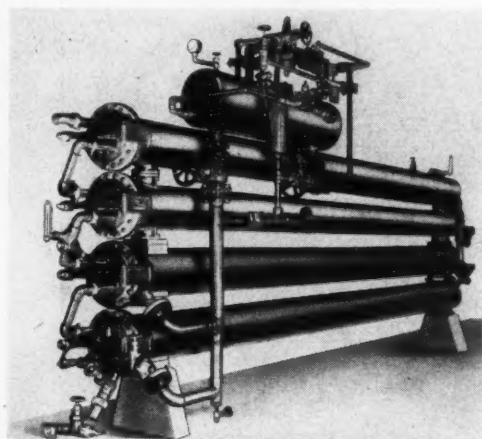
thermoswitch in cooler tube opens and closes back-pressure valve at critical temp

Problem: To obtain proper cooling of wort, beer, or other liquids to a final temperature as low as 29°F and yet prevent "freeze in" in the event of temporary interruption of flow or failure of ammonia back-pressure valve.

Solution: A pipe, equipped with an electric solenoid valve, is inserted between the ammonia back-pressure valve, which operates on pressure differential, and the evaporator side of the system. In the event the wort temperature drops to 43°F — or 29°F for cooling beer—thermostat closes the ammonia back-pressure valve through a solenoid switch, shutting off refrigeration process.

When the wort temperature rises again, the thermostat causes the back-pressure valve to reopen and the ammonia starts to circulate again.

Results: Properly chilled wort and beer, as the case may be, is constantly available. It is not necessary for operator to spend time controlling



Thermoswitch is inserted directly into the cooler tubes so that it will operate when the temperature goes below a predetermined point

liquid temperature or for new operators to become skilled at manual temperature control. "Freezing in" of wort, beer, or other liquids is prevented.

(Hex Head Thermoswitch is product of Fenwal Inc., Dept. CP, Ashland, Mass. . . . or for more information check CP 3331 on handy form located between pages 2 and 3.)

For more information on product at left, specify CP 3332 . . . see information request blank between pages 2 and 3.

BUSINESS IN MOTION

To our Colleagues in American Business . . .

Improve quality, reduce production costs — either or both. That is the aim of Revere in its relations with customers and prospects. Here is an example that is rather spectacular. It involves overlaying a silicon bronze gasket surface 2½" wide around the periphery of a 46-inch diameter, 2½" thick steel tube sheet for a large heat exchanger.

During a call on the manufacturer Revere was given the opportunity to see the overlaying operation. It was being done manually, by the gas-shielded tungsten arc method. Experience showed that the time required to complete the operation was from 6½ to 7 hours. Included in the material cost was a full tank of argon, price about \$26.40. After the gasket surface was completed, it was machined, which sometimes revealed excessive iron pickup, caused by differences in welding speed or other operator variants. Sometimes there would be porosity, sometimes excessive hardness. Repairing these spots by re-welding meant that the surface had to be machined again.

The company in question is highly skilled, and seldom needs to call in people from outside. However, this difficult operation was of considerable concern because of the size of the contract and the extra costs involved. Revere was asked for its opinion. After studying the matter, it was suggested that the gasket surface could be done more quickly and uniformly by semi-automatic methods, using equipment already

available in the shop. The necessary strict details of procedure were developed in the Welding Section of Revere's Research and Development Laboratory at Rome, N. Y. so that we were able to prove the method. The customer's shop was then revisited and assistance given in setting up the equipment, which included a variable-speed welding positioner to rotate the tube sheet under a stationary head. On the first sheet overlaid by this gas-shielded metal arc process, the time required was 49 minutes.

Time thus was reduced by some six hours. Argon consumption was cut to about 25 cubic feet at a cost of about \$3, representing a saving of about \$23 in gas alone. Cost estimates of the two processes indicated a total saving of about \$50 per tube sheet. Since the manufacturer still had over one hundred of these heat exchangers to make before the contract was completed, total savings will amount

to about \$5,000, as a result of the better method.

It is interesting to note that no Revere materials were involved in this work. Nevertheless, Revere was glad to do it for an important customer, one who buys large quantities of our metals.

In these days it is more important than ever to hold costs down. Perhaps your suppliers have some special skills that you could use. No matter what you make, it would be wise to seek their collaboration on the matter of improving quality, reducing costs, or both.



REVERE COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

Executive Offices: 230 Park Avenue, New York 17, N. Y.

SEE "MEET THE PRESS" ON NBC TELEVISION, SUNDAYS

When inquiring check CP 3333 on handy form, pgs. 2-3

NEW SOLUTIONS of processing problems

Yearly cost of corrosion reduced from 16.7 to 6.7 cents/sq ft by protective coating . . .

Pennsylvania Salt Mfg. Co. conducted four-year study to determine best protection

Problem: Protective coatings in use on storage tanks, structural steel roof supports, tank cars, and process equipment were failing to provide the necessary corrosion-resistance at the ferric chloride plant of Pennsylvania Salt Mfg. Co. in Wyandotte, Mich. Yearly cost of this corrosion was 16.7 cents per square foot of corrodible steel surface. Plant was under attack not only from ferric chloride, but also from hydrochloric acid, chlorine gas, and a variety of inorganic chemicals — ammonia in one spot; at another, caustic soda; at still another, potassium persulfate.

Solution: A neoprene-base coating was chosen to protect all corrodible surfaces in the plant. This choice was made after a four-year study of numerous protective coatings.



Neoprene-base coating on tank car (part of which is shown at lower left) is in excellent condition, while conventional coating on other car shows effects of corrosive attack

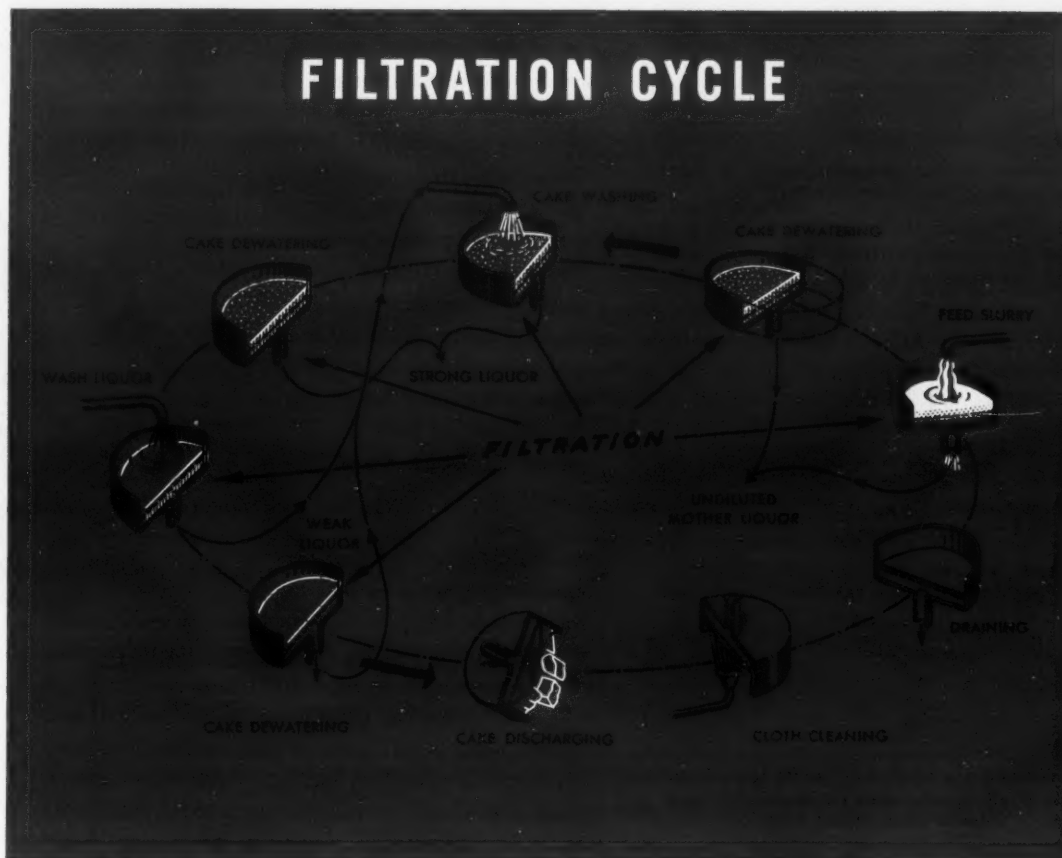
In this study, coatings were tested in different climates. In all, 20 test stations were installed at four different plants — two in Wyandotte, one in Kentucky, and one in Pennsylvania. A card file was kept on each coating and stations were inspected once a month. Coatings were first tested on steel plates exposed in most corrosive areas. Neoprene-base material was in competition with more than 100 coating formulas or systems, ranging from acrylics to vinyls.

Results: In the panel tests, and later in tank tests, neoprene-base coating was found most resistant in all strong acid and caustic exposures.

New to you

(but a proved performer the world over)

the BIRD-PRAYON continuous, rotary, horizontal FILTER



For complete information and to make arrangements for pilot scale test data, get in touch with

A vacuum filter that provides:

- **CAPACITY FOR EVERY NEED** — built in five models to provide filtering areas from 16 to 516 sq. ft.
- **EXTRAORDINARILY EFFICIENT WASHING WITH MAXIMUM SOLUBLE RECOVERY** — *counter-current* washing up to four stages without any dilution of mother liquor, resulting in minimum wash water use and maximum recovery of solubles.
- **COMPLETE DISCHARGE** — accomplished by inverting cells as well as by back pressure; no heel is left on the cloth.

- **CONTINUOUS CLOTH CLEANING** — with sustained high capacity per sq. ft. of area, without diluting slurry or filtrate; long filter cloth life — no scraping or mechanical action; cloths may be replaced one cell at a time in a few minutes or completely changed on the largest Filter in less than three hours. Filtrate is exceptionally clear.
- **SIMPLE, LOW COST OPERATION** — vacuum lines connect cells to valve through flexible hoses, eliminating sliding connections and the need for close alignment between valve and cells; valve is readily accessible.

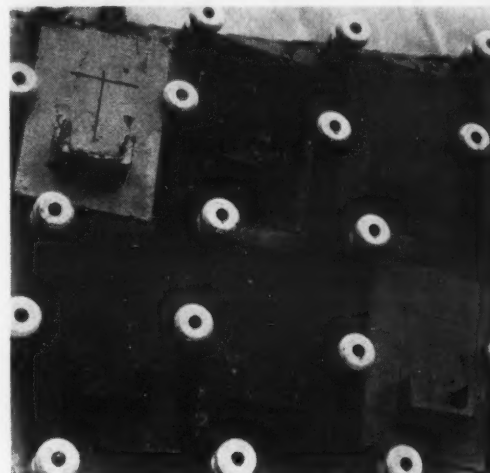


BIRD MACHINE COMPANY
SOUTH WALPOLE • MASSACHUSETTS

When inquiring check CP 3334 on handy form, pgs. 2-3

NEW SOLUTIONS of processing problems

For instance, at the ferric chloride station, this coating was in perfect condition after 72 weeks, while panels under next three best coatings were mottled with corrosion after only 18 weeks.



Coatings were first tested on steel plates exposed in most corrosive areas

Since neoprene-base coating was first prescribed and used as standard for all equipment and structural steel in most corrosive areas, plant has expanded 50% in area. Still, the former maintenance crew of 26 men is able to cope with coating problems of entire plant.

Despite higher first cost of neoprene-base coating, Pennsalt has cut the yearly expenditure from 16.7 to 6.7 cents per square foot of corrodible steel surface. They hope to level off at five cents.

These results are credited to the chemical inertness of neoprene, its resistance to abrasion, and its high build-up per coat. Three coats are used to insure freedom from coinciding pinholes and to produce a minimum thickness of five mils. Two coats of coating and one coat of primer will normally result in a film of from six to eight mils in thickness. A fourth coat has not shown sufficient increase in service life to warrant added cost.

(Information obtained from an article in *Du Pont Magazine*, Vol. 47, No. 5. Protective coating contains neoprene chemical rubber, a product of E. I. du Pont de Nemours & Co., Dept. CP, Nemours Bldg., Wilmington 98, Del. . . or for more information check CP 3335, pages 2 and 3.)

Processing and Engineering Data section begins on page 200

**Performance
plus
Economy**

... COVERING THE
WIDEST RANGE OF
YOUR BATCH MIXING
REQUIREMENTS AT LOW
COST, FIRST AND LAST!

PATTERSON TYPHICON PORTABLE MIXERS

Powerful, lightweight, for
light or heavy duty service.
Direct or Geared Drive. For
mixing, dissolving, suspen-
sion of solids in light to
viscous liquids. $\frac{1}{4}$ to $\frac{3}{4}$
Horsepower. SEND FOR
CATALOG.

**The Patterson Foundry and
Machine Company**
East Liverpool, Ohio, U. S. A.

NEW YORK, BOSTON, BALTIMORE, PHILADELPHIA,
PITTSBURGH, DETROIT, CINCINNATI, ATLANTA,
CHICAGO, ST. LOUIS, HOUSTON, DENVER,
LOS ANGELES, SAN FRANCISCO, SEATTLE

**The Patterson Foundry and
Machine Company, (Canada) Limited**
Toronto, Canada
MONTREAL

Like taking dollars "out of the air",
activated carbon adsorber

recovers over 1000 gal alcohol per day

**Installation includes specially designed
pre-scrubber to remove resin from
solvent-air stream**

GEORGE H. CLARK
Vice Pres. in Charge of Engineering
The Formica Company
with **TED F. MEINHOLD**, Assistant Editor

Problem: Large quantities of alcohol were being
lost daily to the atmosphere at The Formica Com-
pany's plant in Cincinnati, Ohio. Denatured alco-
hol is used by the company to cut phenol-formalde-
hyde resin used to laminate paper and other ma-
terials. Solvent-laden air was vented out of the
plant through exhaust stacks.

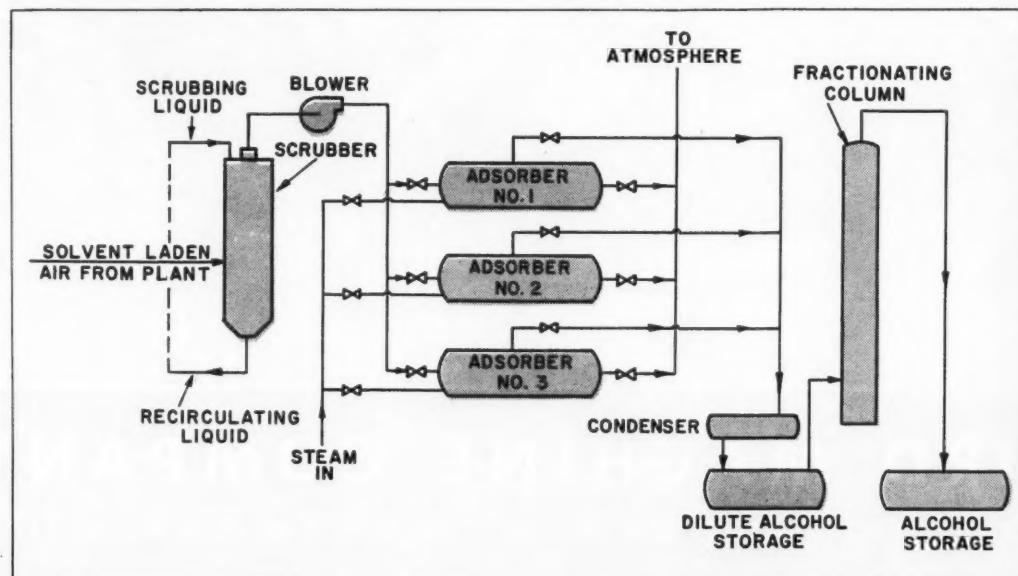
After studying various solvent recovery systems,
officials finally decided that an activated car-
bon adsorption system was best suited for their
set-up — if they could find some way of preventing

the highly contaminating resin from reaching the
carbon.

Solution: Company installed an activated carbon
solvent recovery system with a specially designed
scrubber to remove the resin. Scrubber consists of
packed tower through which air being treated is
drawn upward, counter-current to scrubbing solu-
tion. The resin is continuously being absorbed by
the re-circulating solution, which needs replenish-
ing about once a week.

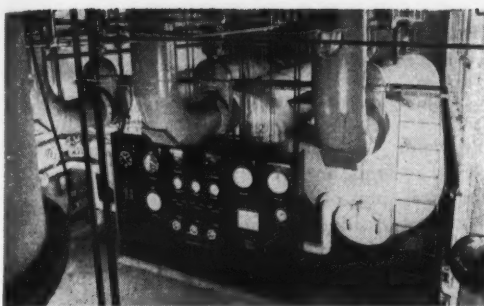
From the scrubber, the resin-free solvent-laden air
passes through the adsorbers. There are three in
the system, each six ft in diam x 26 ft long, con-
taining 6300 lb of granular Adsorbite carbon.
Adsorption cycle lasts about two hours. Solvent-
free air passes directly to the atmosphere from the
adsorbers.

When an adsorber reaches end of cycle it is closed
off from the air stream, and low pressure steam
is admitted. Steam raises temperature of carbon
bed and drives off alcohol. Steaming generally



Flow chart of solvent recovery system at Formica's plant in Cincinnati, Ohio

When inquiring check CP 3336 on handy form, pgs. 2-3



Control panel for three solvent adsorbers (background). Units are run in pairs — two are adsorbing while one is being steamed

takes approximately 30 minutes. Other two adsorbers continue to operate during this time.

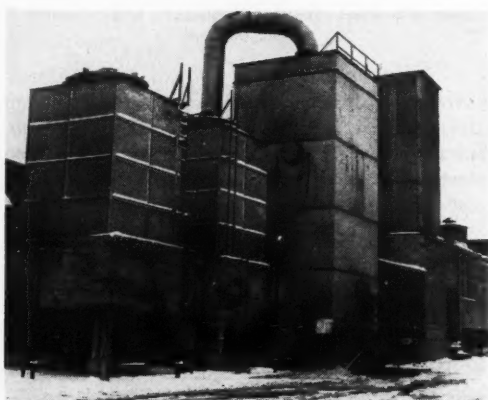
Released vapors from steaming operation pass through condenser and into storage tanks. Fractionating column separates alcohol from water solution, returns solvent to storage tank for re-use.

Results: Formica recovers more than 1000 gal of alcohol per day. This is about 95% of that volume present in the treated air. Volume of air treated by the system is 12,250 cfm. Installation is reported to have paid for itself in first year of operation.

Life span of adsorbers is indefinite. Carbon is expected to last at least several years. In some installations, carbon has been known to last as long as 25 years without replacement.

Phenol-formaldehyde resin can be recovered from scrubber solution for re-use if desired.

(Solvent recovery system and scrubber was designed by Solvent Recovery Division, Barnebey-Cheney Company, Dept. CP, Cassady at Eighth Ave., Columbus, Ohio. Check CP 3337, pgs. 2 & 3.)

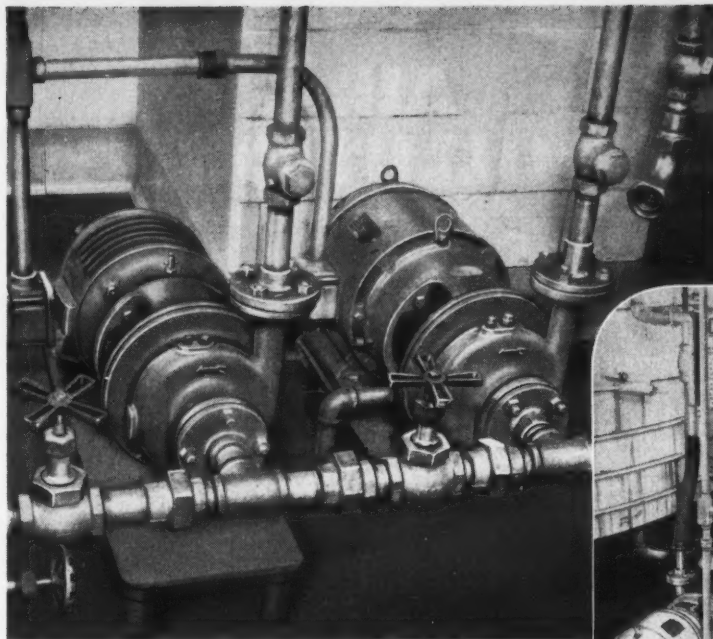


Exterior view of solvent recovery installation. Two cooling towers are at left, scrubber (with inverted "U" duct) in center, and fractionating tower at right

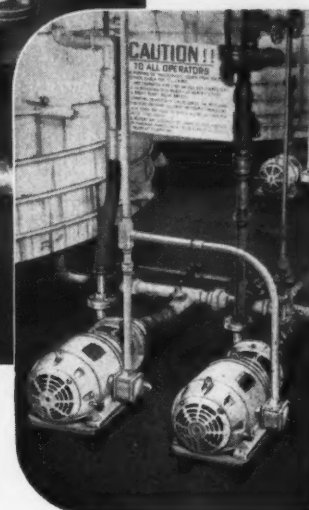
Ampco Centrifugal Pumps, made of Illium "G", pumping vinegar to automatic measuring devices in the Mayonnaise and Miracle Whip Processing Dept., Kraft Foods Co., Chicago, Illinois.

Ampco Pumps are available in most workable alloys. When made from corrosion- and wear-resistant Ampco Metal, they give you all the advantages of a special pump at standard pump prices.

Illium "G" is the registered trademark of the Illium Corp.



Ampco Pumps handling vinegar from tank cars to storage, Kraft Foods Co., Chicago.



Seven reasons why Kraft Foods Co.

uses ... AMPCO* Centrifugal Pumps

- 1 Good corrosion-resistance
- 2 Low capital investment
- 3 No metal-to-metal contact
- 4 High efficiency
- 5 Constant rate of flow
- 6 Durable metallic seals that resist wear — are easy to replace
- 7 Small space requirements

KRAFT uses corrosion-resistant Ampco Centrifugal Pumps to handle the vinegar used in the production of its mayonnaise and salad dressing. These pumps give a dependable flow rate . . . freedom from contamination . . . greater dependability . . . less downtime.

Moreover, Ampco Pumps are used throughout industry for difficult liquid-handling problems. They represent pump design at its best — both hydraulic and mechanical. They save power — have wide performance range, good characteristics, high efficiencies (up to 85%). They save money — you get a special pump at a standard pump price. They're built of Ampco Metal — the special alloys that make good where other metals fail. That's why they're unusually resistant to wear, corrosion, erosion,

cavitation-pitting, and deformation. That's why you get a pump that will successfully handle abrasive solids in suspension or viscous liquids.

Best of all, Ampco Pumps are production-built, competitively-priced in a wide range of sizes. You can get them not only in Ampco Metal, but also in Illium "G" or other workable alloys to meet the requirements of unusual jobs.

Put these standard units to work for you — give them the tough jobs that formerly required high-priced special pumps. Take advantage of low-cost, long-life, headache-free pumping. Check with your nearby Ampco distributor or write us for the solution to your difficult fluid-handling problems. *Reg. U. S. Pat. Off.

Clip this coupon to a postcard and mail today.

AMPCO METAL, INC., Dept. CP-11, Milwaukee 46, Wisconsin

- ☐ I'm interested in Ampco Centrifugal Pumps. Send me bulletin No. P-3a.
- ☐ I'd like to know more about Ampco Metal for use in process industries. Send me more information.

Name.....Title.....

Company.....

Company Address.....

City.....(.....) State.....

PR-14A

Ampco Metal, Inc.

MILWAUKEE 46, WISCONSIN

WEST COAST PLANT,
BURBANK, CALIFORNIA



LET AMPCO PROVE ITS METAL

When inquiring check CP 3338 on handy form, pgs. 2-3

AIR POLLUTION

IS AS CLOSE AS YOUR PARKING LOT!



Dust Covered Cars Offer **VISUAL PROOF** That a Dust Control Problem Is Just **HALF LICKED**

TAKE a look at the cars in your parking lot. They quickly show the effects of settled materials, many of which damage automotive finishes in surprisingly short periods of contact time.

If such dust is a source of irritation and expense to your employees, you can be sure that it is equally offensive to the surrounding neighborhood.

It's a problem resulting from half-way measures—solving inside dust problems at the expense of outside areas.

The solution is *complete* dust control as provided

by AAF equipment. Dynamic precipitators, hydrostatic precipitators, dry centrifugals, fabric arresters—you'll find them all in the AAF line. There's a unit to cope with *any* type of dust—*completely*.

Let your parking lot be the metering device for dust conditions in your plant area. Your local AAF representative will check your dust sources and recommend effective, economical means of control. Call him today or write us direct.

**AAF EQUIPMENT DOES THE COMPLETE JOB
—INSIDE AND OUT.**



American Air Filter

COMPANY, INC.

American Air Filter of Canada, Ltd., Montreal, P. Q. • 258 Central Avenue, Louisville 8, Kentucky

When inquiring check CP 3339 on handy form, pgs. 2-3

NEW SOLUTIONS of processing problems

**Plastic replaces wood in spigots
that failed in 1 to 26 weeks
on tar acid filter presses . . .**

phenolic spigots still going strong after 6 months

Problem: Spigot and key drains made of wood failed in from one week to six months when used on filter presses handling cold tar acids at the National Aniline Division of Allied Chemical & Dye Corporation's plant in Buffalo, N. Y. Wood softened and swelled, closing off opening (see photo). Sometimes entire spigot fell apart.

Solution: Phenolic plastic spigots, molded of Durez molding compounds, were substituted for the wood where cold acid solutions were being processed. The molding resin has these physical properties:

| | |
|--|--------|
| Compressive strength (psi, min) | 27,000 |
| Sp gr | 1.40 |
| Water absorption (% max) | 1.0 |
| Impact strength (ft lb/in, min) | 0.55 |
| Modulus of elasticity (tension, $\times 10^6$ psi) | 1.0 |

Results: Plastic spigots have been in continuous service over six months and show little or no deterioration. Company engineers state that not only



Left to right: Wood spigot (key at side) after use on tar acid filters. Wood and phenolic spigots before being installed

have spigots proved satisfactory for their chemical resistance to both acid and alkali solutions, but also for their ability to withstand impact when forced into filter press openings. Higher initial cost of plastic spigots is more than offset by their longer life.

(Durez molding compounds and resins are a product of Durez Plastics & Chemicals, Inc., Dept. CP, 17 Walck Rd., North Tonawanda, N. Y. . . or for more information check CP 3340 on handy form, pages 2 and 3.)

(Plastic spigots are molded by Norton Laboratories, Inc., Dept. CP, 1035 Mill St., Lockport, N. Y. . . or for more information check CP 3340A on handy form, pages 2 and 3.)

**Troublesome tramp iron removed
from paper plant's pipeline
by magnetic hump . . .**

prevents pump breakdowns, removes 2 bucketfuls baling wire per month

Problem: Baling wire and other forms of tramp iron were causing so much havoc in the Eastern plant of a large paper manufacturer that pump in white water line had to be serviced four or five times a week. Labor and downtime averaged about one hour for each service job required on the line.

Solution: A magnetic pressure hump was installed in the line at point following beaters and ahead of the jordan. Designed to operate in pressures up to 45 psi, the hump deflects flow of material 30°, directly across faces of two large



Operator removing accumulations of wire and other tramp iron from magnetic pressure hump

permanent magnets. Tramp iron is plucked out by penetrating action of Alnico V metal magnetic elements and held fast until removed by operators in routine periodic cleaning. Being non-electric, hump requires no wiring and was quickly installed in the plant.

Results: According to company's plant engineer, unit removes about two bucketfuls of tramp iron per month. Screening is continuous, automatic, and permanent. Hump requires virtually no maintenance and is guaranteed for mechanical life of equipment in which it is installed.

Officials estimate that in less than two years' time, the increased life of pump, elimination of downtime, and reduction of white water waste will more than pay for unit's installation.

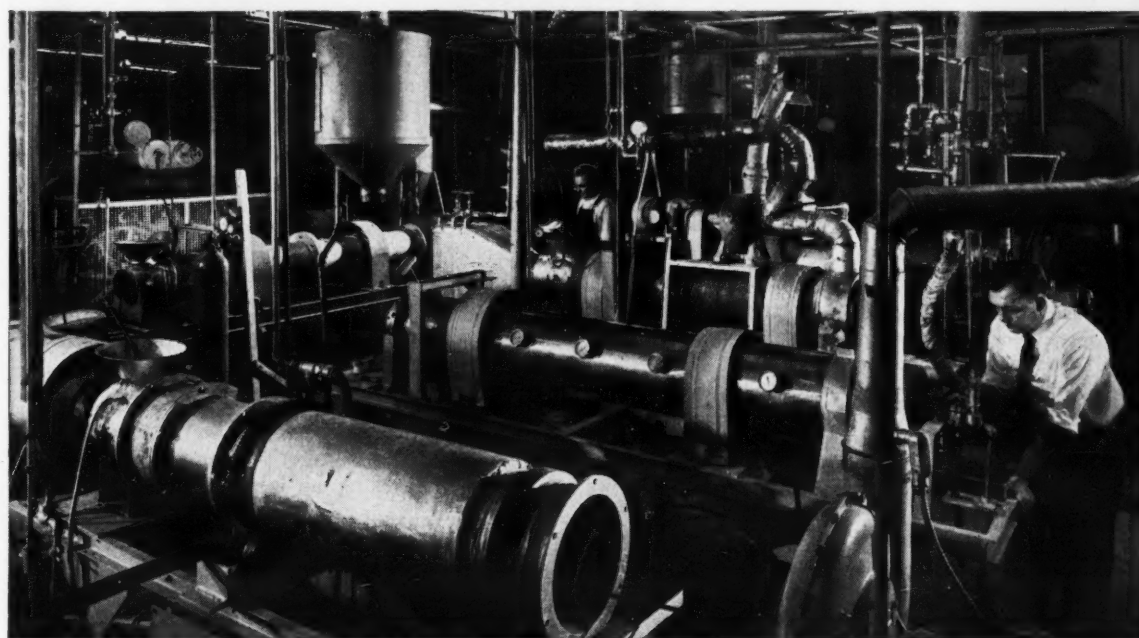
(Magnetic pressure hump is product of Eriez Manufacturing Company, Dept. CP, 13 Magnet Drive, Erie 6, Pa. . . . or for more information reader may simply check CP 3341 on the convenient Reader Service slip which is located between pages two and three.)

Louisville Method

In our lab, small Louisville Dryers solve big drying problems for customers

Here's where Louisville Dryer performance is proved *before* you buy. In our East Chicago pilot plant, pilot dryers duplicate on a small scale the exact conditions of any drying process. From their operation, our drying specialists get the answers to questions like these: What size should it be? Which dryer type is best? What special design features will improve operation? What experience from our thousands of installations can best be applied to this problem?

Advance testing in our pilot plant is just one of the steps we take to make sure every Louisville customer gets more than satisfactory results. From initial surveys by drying engineers to follow-up checks after installation, Louisville insures maximum performance from your dryers. Why not take advantage of these facilities? A Louisville engineer will be glad to look over your drying operation. There's no obligation . . . and the savings that may result are all yours.



**LOUISVILLE DRYING
MACHINERY UNIT**
*over 50 years of creative
drying engineering*

**GENERAL AMERICAN
TRANSPORTATION CORPORATION**

Dryer Sales Offices: 139 South Fourth Street, Louisville 2, Kentucky
General Offices: 135 South LaSalle Street, Chicago 90, Illinois
In Canada: Canadian Locomotive Company, Ltd., Kingston, Ontario

OFFICES IN ALL PRINCIPAL CITIES

Other General American Equipment: Turbo-Mixers • Dewaterers
Towers • Tanks • Pressure Vessels

For dependability see General American—creative engineering, design, construction, installation

When inquiring check CP 3342 on handy form, pgs. 2-3

Similarity in Valves doesn't mean a thing in service ... Chicago process plant reports

The Installation

At Hysan Products Co., Chicago manufacturer of liquid waxes, pine oil and coal tar disinfectants, liquid soaps, insecticides and various chemical specialties—where Crane clamp gate valves have been installed on all process and storage piping.

Valve Service Ratings

SUITABILITY: Performance-proved

FEATURES: Tight seating

MAINTENANCE COST: Only routine care given

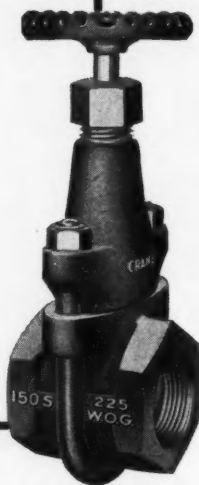
SERVICE LIFE: Many times former valves—still like new

OPERATING RESULTS: Costly loss and trouble stopped

AVAILABILITY: Crane Catalog item—No. 488

The Valve

Crane clamp gates are of rugged design, with seating surfaces machined to close tolerances. That's why they provide long-lasting, tight closure, even where operation is frequent and fluids are hard to hold. Many patterns to choose from in these compact valves—all iron or brass-trimmed. Consult your Crane Catalog or your Crane Representative.



THE BETTER QUALITY... BIGGER VALUE LINE... IN BRASS, IRON, STEEL

CRANE VALVES

CRANE CO., General Offices: 836 S. Michigan Ave., Chicago 5, Illinois
Branches and Wholesalers Serving All Industrial Areas

VALVES • FITTINGS • PIPE • PLUMBING • HEATING

When inquiring check CP 3343 on handy form, pgs. 2-3

The Case History

Longest service given by similar type valves formerly used was from 2 to 6 months. They failed to hold tight at seats and disc under daily operation of 3 to 12 cycles. Valve maintenance and replacements were excessively costly—as were down-time losses. Leaky valves on tank lines forced repeated transfer of storage stock. Up to 3 men were needed to make valve repairs.

Only when the plant switched to Crane No. 488 clamp gate valves was the trouble stopped. Installed more than a year ago, the valves show no sign of wear or leakage. Only an occasional pull-up on the packing nut is needed—and only one man for all piping maintenance.

What's the answer? Better quality valves, obviously—the only way to assure better service and lower ultimate cost.



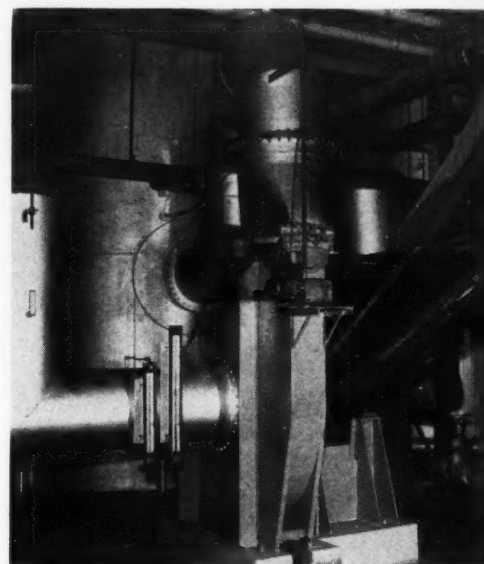
NEW SOLUTIONS of processing problems

Corrosive gases successfully handled with specially designed fans at Liquid Carbonic...

choice of materials and care in fabrication
lengthen life of blowers

Problem: About five years ago Liquid Carbonic Corporation became concerned about the cost of maintaining and replacing fans used for handling flue gases in several of its plants. Blowers in some plants lasted only about a year on an average, some failing within six months. Each failure caused a financial loss of several thousand dollars, in addition to interrupting production.

Fans handle products of combustion from gas or oil, which vary with plant location and source of supply. CO₂ in the flue gas is absorbed to produce



Corrosion-resistant fan used in dry ice manufacturing operations at Liquid Carbonic

dry ice. Gas contains SO₂, SO₃, NO₂, and is saturated with water vapor, making it very corrosive.

Solution: Fans were installed that are specifically designed to combat the corrosive conditions. Materials were selected by Liquid Carbonic based on tests conducted under actual service conditions.

Tests indicated that Hastelloy C was best suited for some applications and 316 stainless steel for others. Neoprene was entirely adequate in resisting corrosion, but operating tip speed of wheels (20,000 feet per min) prohibited its use on them. Consequently, it was applied only to the housing interiors.

Wheel design was a compromise between possible life and original cost. In fabrication of wheel shell, rivets were not used because of their limited size

in these members and the possibility of excessive corrosion in them resulting from high internal stresses and carbide precipitation caused by having to drive them hot. Blades were continuously welded to hub-plate on either side, but were flanged and rivet-welded to the rim.

Actual results in service indicated little, if any, corrosion in parent metal directly adjacent to the welds as the result of carbide precipitation. Consequently, all later wheels have had blades continuously welded to the rim as well as to hub-plate. Wheel shell was originally riveted to cast hub primarily to facilitate reuse of original hubs in replacement wheels if corrosion did prove to be excessive.

Flanging of all openings in housing enabled best possible covering of neoprene to be made. Neoprene covering is carried out over face of each flange and each joint and is provided with an $\frac{1}{8}$ " soft rubber gasket. This gasket provides a rigid joint to avoid fracture of covering and at the same time permit the use of through bolts, which can be replaced in case corrosion should develop in them. All interior joints under neoprene covering are continuously welded and welds ground smooth to avoid air pockets.

Results: Fans fabricated in this way that were installed as long as five years ago are still providing excellent service. Accompanying photograph shows one unit in service at the Belleville, N. J. plant of Liquid Carbonic.

(Fans are manufactured by American Blower Corp., Dept. CP, Detroit 32, Mich. . . . or for more information check CP 3344, pages 2 and 3.)

Have You Wondered Why —

a manufacturer's name and address appear at the end of many articles . . . ?

The "source" of editorials, which we indicate by publishing a company name and address at the end of many articles, is not "advertising" for the manufacturer. It's put there as an editorial service to help you get more information on processes, materials, ideas, and equipment which interests you. It also helps us to decide, from your response, which subjects you want most in **CHEMICAL PROCESSING**. Our handy Reader Service slip, located between pages 2 and 3, helps you to get the details you want in a hurry . . . helps us get the best stories in lining up future issues.

THE EDITORS

Announcing New, Re-Designed **Arktite**

**HEAVY DUTY
PLUGS & RECEPTACLES**



NEW pressure connectors; no soldering unless you prefer to do it.

NEW easier-to-wire interior assembly; comes out in one piece—just remove 2 screws.

NEW easier-to-interchange plug and receptacle interiors; no machining; no special tools.

NEW plug adaptability; takes any size portable cable up to full 30 amp. capacity.

Circuit-Breaking Features Make Arktite Safe at Full Load Without Disconnect Switches

Each contact is insulated in a separate chamber. Arcs formed while making or breaking circuit are snuffed out in arcing chambers by pressure-deionization and lack of oxygen. No chance of flash-over even if break is made at full load. With grounding contacts longer than load contacts, plug and tool are grounded *before* circuit is made and *after* it is broken.

New Arktites now available in 30 amp. size — 2-pole, 3-pole and 4-pole styles. Fully interchangeable with old Arktites — same economical price.

SEND FOR
FREE BULLETIN

OR SEE YOUR
CROUSE-HINDS
DISTRIBUTOR.



A
NATIONWIDE
DISTRIBUTION
exclusively through
ELECTRICAL
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CONDULETS • FLOODLIGHTS • TRAFFIC SIGNALS • AIRPORT LIGHTING

When inquiring check CP 3345 on handy form, pgs. 2-3

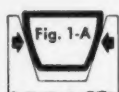


This simple idea saves money in V-Belt Costs

*You can
prove it in two minutes!*



To prove how the **CONCAVE SIDES** of GATES VULCO ROPES *save money*, just make this simple test—



Bend any V-Belt that has *straight sides* (Fig. 1) and—as the belt bends—*feel the sides bulge out* (Fig. 1-A). This out-bulge concentrates the wear at the points shown by arrows—and this naturally shortens the life of a *straight-sided* belt!

Now bend a Gates Vulco Rope with **CONCAVE SIDES** (Fig. 2)

(U. S. PAT. 1813698)



You find that the **CONCAVE SIDES** *fill out* and become perfectly straight. They thus press *evenly* against the V-pulley. All wear is distributed *uniformly* across the *full width* of the GATES VULCO ROPE—and this means *longer belt life* and *lower belt cost* for you!



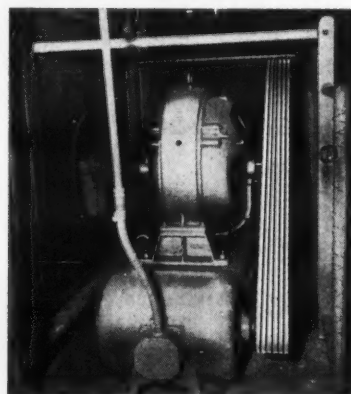
When you buy V-Belts, be sure to get the V-Belt with the **CONCAVE SIDES**—the GATES VULCO ROPE!



VULCO ROPE DRIVES

THE GATES RUBBER COMPANY
DENVER, U.S.A.

Gates Engineering Offices and Jobber Stocks are located in all industrial centers of the United States and Canada, and in 70 other countries throughout the world.



Typical Gates Vulco Rope Drive—the Gates V-Belts are built with Concave Sides to insure longer belt wear.

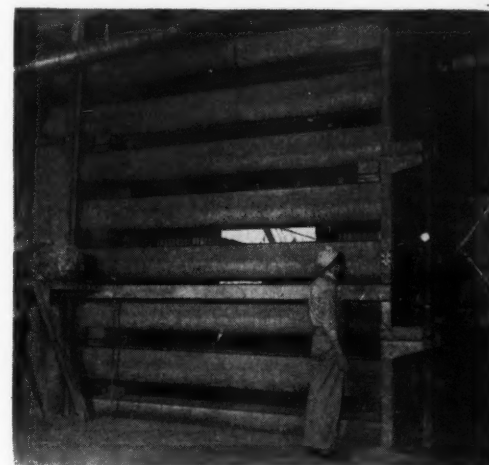
NEW SOLUTIONS of processing problems

**Solves tough solids-cooling job,
using one-quarter former hp
and floor space . . .**

hollow-flight exchanger cools cottonseed cake from 265 to 90°F, continuously

Problem: When cottonseed is pressed for oil extraction, resulting cake leaves the expellers at around 265°F. This temperature is much too hot to grind and bag as cattle feed, or to store until needed for grinding.

At California Cotton Oil Co., Los Angeles, methods were tried using water-cooled dryers, and rotary, agitated air-cooled dryers. At the production level at which California Cotton Oil was running, these coolers were incapable of lowering the temperature below 160°F. It was required that temperature be lowered to at least 105°F to avoid burning of the product in stack or bag, and eliminate danger of spontaneous combustion.



Screw conveyor brings hot cake from expellers to top-most twin-screw heat exchanger. Cake cools as it is conveyed by the hollow screws through one exchanger, then drops to next level for continuous flow through the seven tiers shown here

Solution: Cottonseed cake from expellers is now conveyed through a series of hollow-flight screw heat exchangers. Cooling water flows through each of the hollow screws and shafts, cooling the cake as it is conveyed through the seven-tiered cooler.

Each tier is 10' long, with screws 11" in diameter. Two intermeshed hollow screws, side-by-side, and turning in opposite directions in an enclosed trough, comprise each unit. Thus the product is constantly being brought into contact with the heat-exchange surface of the screw shaft and flights.

Cooler uses 350 gal water/min, in counter-current flow, during summer when cooling tower water is 78°F. In winter, water flow is reduced. Unit handles around 220 tons of meal per 24-hr day.

Results: The pressed cake is reduced from 265° to 90°F in a continuous, trouble-free operation occupying one-fourth the floor space formerly needed. Horse power requirement is also one-fourth that used before. Cooling area is now much cleaner since the entire cooling operation takes place in an enclosed system. Rotation is slow (13 rpm) so that conveying action is gentle, and little dusting is encountered.

Maintenance has been nil, in spite of straight 24-hr daily operation each season for the past five years.

(Holo-Flite Processor is manufactured by Western Precipitation Corp., Dept. CP, 1061 West Ninth St., Los Angeles 15, Calif. . . . or for more information reader may simply check CP 3347 on the convenient Reader Service slip which is located between pages two and three.)

Company's product put on display in customer's plant by the use of lithographed drums . . .

attractive display adds only a few cents to the original cost of each drum

According to T. F. Washburn Company, outstanding advantage of lithographed drums is that they let visitors and other people know that a manufacturer's product, of which he is duly proud, is being used in a particular plant. This Chicago manufacturer of



Lithographed drums being filled with thixotropic alkyd resin for use in coatings

resins for protective coatings has been using lithographed drums for about two years. Lithographing makes a distinctive package of a 55 gal drum. The drums are economical, lithographing adding only a few cents to the cost of each drum.

(Lithographed drums are product of Rheem Mfg. Co., Dept. CP, 477 Madison Ave., New York, N. Y. . . . or for more information reader may simply check CP 3348 on the convenient Reader Service slip which is located between pages two and three.)

It takes Six Bolts - not just four

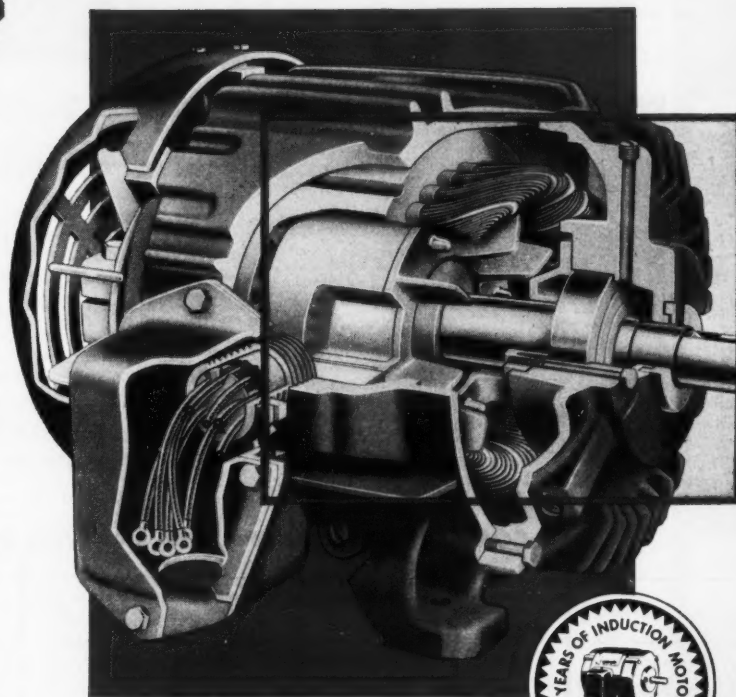


to give full bearing protection for greater motor performance

THE TWO EXTRA BOLTS in the end housing of every Allis-Chalmers ball bearing motor are the proof of extra protection against bearing failure. These are the bolts that hold the bearing cap tightly in place against the inner face of the bearing enclosure. This cap, with its close running clearances, keeps grease from the interior of the motor . . . retains an ample supply within the bearing enclosure . . . protects the grease and the bearing against contamination from dirt and moisture.

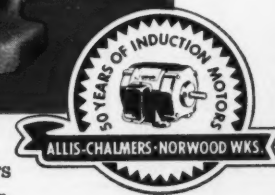
At the outer side of the bearing, double labyrinth seals keep grease in, also keep dirt out. What's more, large grease reservoirs act as additional dirt traps.

Result? Allis-Chalmers motors pay off in longer, trouble-free bearing life, lower motor maintenance.



Get all the facts . . . judge for yourself — Compare Allis-Chalmers motors with other motors. Get the six-bolt construction that gives you complete bearing protection. For proof, see your Allis-Chalmers Office or Authorized Distributor, or write — Allis-Chalmers, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS



A-4444

When inquiring check CP 3349 on handy form, pgs. 2-3

HOW INTALOX® SADDLES CAN REDUCE TOWER HEIGHT AS MUCH AS 30%

If your choice of a tower filling is based on what packing will, for an equivalent throughput, be most economical in both initial tower investment and operating costs — take a look at these charts and their accompanying table.

This is another typical demonstration of the striking savings that can be made through the use of Intalox saddles. It is based on observed capacity data in a pilot plant operation where CO₂ is removed from an inert atmosphere using a dilute aqueous caustic solution.

It will pay you to analyze tower construction and operating costs in the light of greatly reduced tower height and weight. You'll quickly see why cost-conscious engineers are more and more frequently designing towers to use to the full pronounced advantages of Intalox saddles.

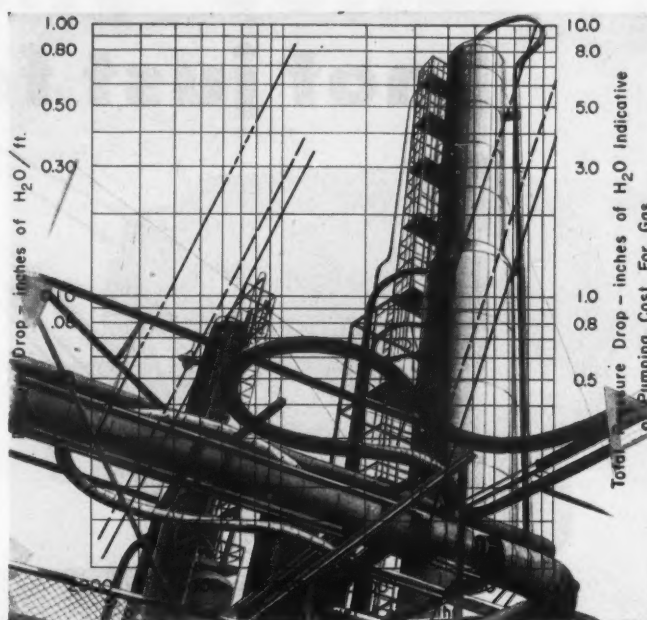


Chart No. 1 (Above)

Pressure drop data comparison. Data shown both in inches of H₂O per foot, and total pressure drop in inches of H₂O.

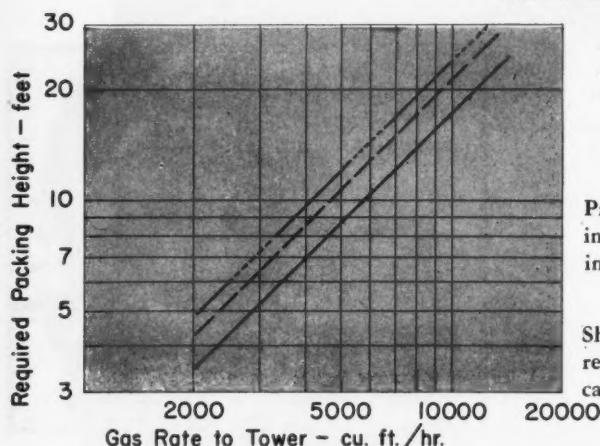


Chart No. 2 (Left)

Showing comparison of packed height required for removal of CO₂ from an inert atmosphere using dilute caustic liquor as the scrubbing liquid.

COMPARATIVE STUDY BASED ON DATA SHOWN ABOVE

| | Tower Cross-section, Sq. Ft. | Required Packed Height* Ft. | Packing Weight Lbs. | Weight of Steel Shell—3/4" Thick | Weight Packing & Shell Lbs. | Total Column Hold-up Cu. Ft. | Pressure Drop—Inches of H ₂ O** |
|--------------------|------------------------------|-----------------------------|---------------------|----------------------------------|-----------------------------|------------------------------|--|
| 1" Raschig Rings | 1.0 | 12.0 | 480 | 672 | 1152 | 0.76 | 2.0 |
| 1" Berl Saddles | 1.0 | 10.5 | 473 | 588 | 1061 | 0.68 | 0.77 |
| 1" Intalox Saddles | 1.0 | 8.6 | 293 | 482 | 775 | 0.68 | 0.47 |

* To remove 90% of the CO₂ from the gas; initial gas composition being the same in all cases.

** For a gas flow of 5,000 cu. ft./hr. and essentially atmospheric operation.

UNITED STATES STONWARE CO.

Process Equipment Division
NEW YORK

CHICAGO

AKRON 9, OHIO

HOUSTON



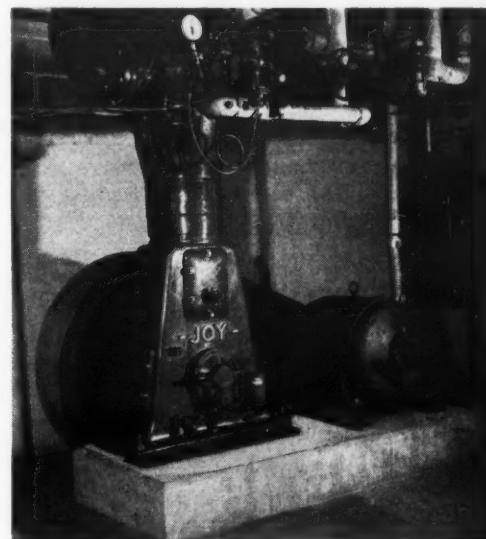
NEW SOLUTIONS of processing problems

Oil-free air for antibiotics furnished by compressors at Bristol Labs . . .

made possible by carbon graphite piston rings which need no lubrication

Problem: Oil-free air was required for sterile finishing operations in the production of penicillin and other antibiotics at Bristol Laboratories, Syracuse, N. Y.

Solution: Two oil-free compressors were placed in service, the first one being installed in 1951 and the second in 1953. These units utilize carbon



Compressor is compact and economical

graphite piston rings, plus several other specifications, which make them capable of producing air entirely free of lubricating oil. Carbon rings need no lubrication.

Each of the compressors provide 300 cfm of air at 100 psi. They are operated continuously. At Bristol, air is sent through an aftercooler to wring out moisture. Air must not be overcooled since water temperature on discharge side of jacket is critical. Inside wall temperature must be held above dewpoint. Otherwise, water would condense in cylinder and cause damage to carbon rings or to valves.

Results: Compressors have furnished air entirely free of oil for the antibiotics operations. Units are compact and economical.

(Oil-free compressors are product of Joy Mfg. Co., Dept. CP, Oliver Building, Pittsburgh 22, Pennsylvania . . . or for more information reader may simply check CP 3351 on the convenient Reader Service slip which is located between pages two and three.)

When inquiring check CP 3350 on handy form, pgs. 2-3

Pressurized blast furnace produces 15% more pig iron . . .

also cuts coke consumption

Pressurizing top part of blast furnace is reported to increase daily output by as much as 15%. One such furnace produced 574,028 tons of iron in 1953 — believed to be an all-time record for an American furnace using American iron ore without adding scrap iron or steel to charge.

Top pressure operation is accomplished by throttling gases from furnace. Reducing gas is thus slowed down and pressure built up. In addition to increased output, coke consumption is reduced, and flue dust losses reduced by more than a third.

(Process is licensed by Arthur D. Little, Inc., Dept. CP, 30 Memorial Drive, Cambridge, Mass.)

New growing method improves yeast's food value . . .

find that cultures have higher methionine content

Method of growing yeast has been developed which is reported to improve its value as supplement to food and fodder. Process results in greater production of methionine, an amino acid in which yeast has been inadequate.

Scientists grew 20 different species of yeast on various media and found that six species could be made to produce greater quantities of methionine by increasing amount of nitrogen salts available to them. By adding cystine, another amino acid, to the media, production of methionine was greatly increased.

(Work was performed at University of Wisconsin, Dept. CP, Madison 6, Wisconsin.)

For more information on product at right, specify CP 3352 . . . see information request blank between pages 2 - 3.

PROCESS EQUIPMENT NEWS

PUBLISHED BY FABRICATED PRODUCTS DIVISION, THE M. W. KELLOGG COMPANY

NOVEMBER 1954

Interchangeable Bundles for Three Condenser Units

Three condensers recently completed in the Kellogg shops for a major refiner represent an optimum interchangeability of bundles—a feature every refiner wants but one that is often difficult to achieve in a unit without over-engineering it.

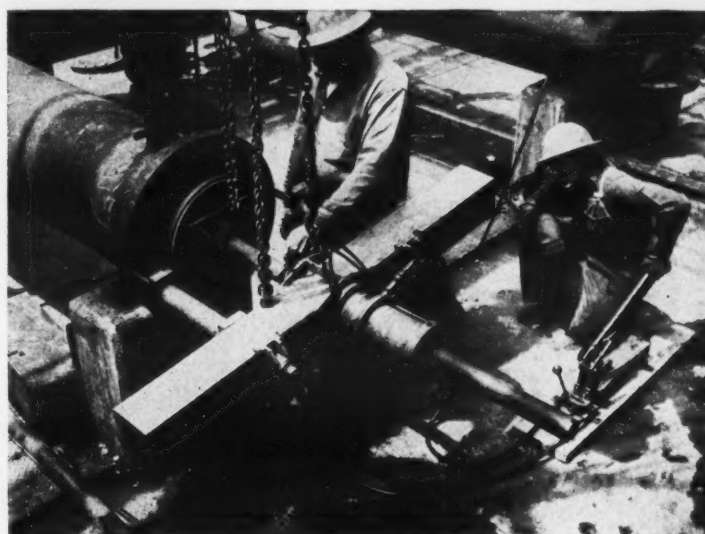
The three condenser units, designed to handle C-4 cuts, comprise a total of 14 shells. Following normal design practices, initial Kellogg engineering proposals included three sizes of shells. However, further study by Kellogg engineers proved, in this instance, that it would be most economical in the long run to design the entire group of 14 shells for interchangeable bundles. Both proposals were submitted, the customer agreeing that the interchangeable bundle plan best served their purposes.

Each of the 14 sections are of floating tube sheet construction with 2040 square feet of $\frac{3}{4}$ -inch admiralty tubes, naval brass tube sheets, and steel baffles. Inside diameter of each shell is 33 inches.

Interchangeable bundles for this many sections will offer several important advantages to the refiner. They will, for example, cut down considerably on refinery maintenance stock, since only one spare bundle need be kept in stock to service any one of the 14 sections. Shorter down-time for repairs are also expected to result from the fact that the spare bundle can be substituted easily in an emergency without shutting the unit down for lengthy repairs or rebuilding.

FABRICATED PRODUCTS DIVISION
M. W. KELLOGG COMPANY
222 Broadway, New York 7, N. Y.
In Canada: Kellogg Engineering Limited
100 King Street West, Toronto
In Europe: Kellogg International Services
100, rue de la Paix, Paris 1, France

M KELLOGG W
PULLMAN



Portable Bundle Puller Saves Time Eliminates Costly Rigging

Shown here in use at a major Eastern refinery is Kellogg's special device, known as the Hydro-ejector, for removing and inserting heat exchanger bundles.

The device, portable and easily operated by two men, reduces down-time and eliminates the need for "jerry-built" rigging often required to pull even the smallest tube bundles. From the standpoint of time, experience has shown that it takes less than 25 minutes for the device to push a tube bundle out eight feet.

And even the largest bundles will not stick when pushed by the force of 12,000 pounds that may be exerted by the Hydro-ejector. The device is attached directly to the bonnet-end shell flange of the exchanger. It does not pull a bundle; it pushes it.

The Hydro-ejector is safer to use—particularly in the case of overhead exchangers—because workmen do not have to clamber out on the bundle after it is partly pulled to attach hoists. Ropes for lowering the bundle are

attached as it is ejected and ride along with the unit from a trolley on the hoisting beam.

The Hydro-ejector will fit any size exchanger. Although now available for use in existing refineries, the unit was originally designed for customary types of exchangers in new processing plants as a means of reducing investment for supporting steel work. In cases where more than one Hydro-ejector is used, all parts including the jack and pumping unit are interchangeable. The only auxiliary equipment are two hoists, suspended at the channel end of the exchanger, to handle the tube bundle as it is ejected or replaced.

In operation, two men may work it with ease. One is required to pump the jack while the other keeps an eye on the bundle to ensure alignment.

Each unit consists of a hydraulic center-hole jack, supported by a fabricated steel base which is bolted directly to the exchanger. It is self-contained and portable, the heaviest piece of equipment being less than 75 pounds.

Send for New Booklet On Kellogg Exchangers

A new booklet which describes in detail the types of tubular heat transfer equipment available from Kellogg has just been completed. It not only shows examples of a variety of heat exchangers, coolers, condensers, reboilers and other process equipment, but also covers in some detail the expanded facilities available at Kellogg since the shops were modified for production-line manufacture of heat transfer units.



M KELLOGG W

EXCHANGERS

M KELLOGG W

THIN WALL ALLOY PIPING

M KELLOGG W

CLAD STEEL VESSELS

M KELLOGG W

CONDENSERS

M KELLOGG W

FRACTIONATING TOWERS

M KELLOGG W

PRESSURE PIPING

M KELLOGG W

DIGESTORS

M KELLOGG W

COOLERS

When used in surface coating formulations, *p*-*tert*-butylbenzoic acid—

improves high resin lacquers

Physical properties enhanced,
drying times shortened

Uses: As a component of short and medium oil alkyd resins, compound enhances physical properties, permits shorter baking time. It also contributes to the physical properties of other high resin lacquers. On esterification with unsaturated alcohols it gives polymerizable monomers. Such esterified compounds can be hydrogenated to the saturated acids, and can also be converted to the nitriles.

Features: When fatty acid content of a short oil or medium oil alkyd is partially replaced by *para*-*tert*-butylbenzoic acid (*p*-*t*-BBA) faster air drying times result and shorter baking cycles to equal hardness can be used. In both oxidizing and non-oxidizing alkyds, compound improves color and gloss, and resistance to discoloration in use.

Improved solvent, caustic, soap, and water resistances are achieved when *p*-*t*-BBA replaces a portion of the fatty acids in medium or short alkyds. Because of the improved chemical resistance and increased hardness, it is often possible to eliminate at least half of the amino resin used in combination baking alkyd systems and still maintain excellent film performance.

Acid-modified non-drying alkyds in nitrocellulose lacquers contribute to increased hardness, improved sanding characteristics, resistance to print, and water and alcohol spotting. Alkyds containing high

percentages of the compound are hard, thermoplastic resins which give these lacquers the properties obtained with rosin-modified maleic resins, but with better chemical resistance and no after-yellowing tendencies.

Description: *p*-*tert*-Butylbenzoic acid is non-toxic, although heavy dust concentrations may cause irritation. This high purity acid is adaptable to conventional resin cooking techniques of direct flux-

ing, alcoholysis, or solvent reflex. Since compound has lower vapor pressure than phthalic anhydride, it offers no sublimation problem when handled carefully. Acid resists oxidation and retains its color in high temperature condensations.

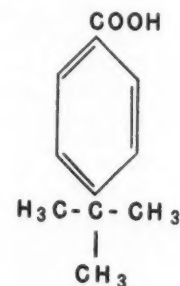
(*para*-*tert*-Butylbenzoic acid is a product of Shell Chemical Corp., Dept. CP, 50 W. 50th St., New York 20, N. Y. . . . or for more information check CP 3353 on handy form, pages 2 and 3.)

Formulation Data on *p*-*t*-BBA Alkyds

| % <i>p</i> - <i>t</i> -BBA Replacement | 33 1/3 | 66 2/3 | 99 | 100 | 100 |
|--|--------|--------|-------|-------|-------|
| MATERIAL | | | | | |
| Glycerol | 28.2 | 28.5 | 29.2 | 27.4 | 20.5 |
| Pentaerythritol | — | — | — | — | 6.85 |
| Phthalic anhydride | 41.7 | 42.3 | 42.7 | 31.2 | 31.2 |
| <i>p</i> - <i>t</i> -BBA | 7.56 | 15.4 | 23.3 | 41.4 | 41.4 |
| Cottonseed fatty acid | 5.02 | 5.05 | 5.2 | — | — |
| Coconut fatty acid | 17.7 | 8.9 | — | — | — |
| PREPARATION OF ALKYD | | | | | |
| Up heat time (hr) | 1 1/2 | 1 1/4 | 3 1/2 | 3 1/2 | 4 3/4 |
| Time @ 475-490°F (hr) | 2 3/4 | 1 1/2 | 1 | 1 3/4 | 1/4 |
| PROPERTIES @ 50% N.V. IN XYLENE | | | | | |
| Viscosity (Gardner-Holdt) | X | Z-3 | Z-6 | B | R |
| Color (Gardner-Holdt) | 5+ | 5+ | 5+ | 4-5 | 5 |
| Softening point (Durrans Hg method °F) | 168 | 175 | 190 | 175 | 193 |

Typical Physical Properties of *p*-*tert*-Butylbenzoic Acid

| | |
|--------------------------------------|-----------|
| Acidity (phenolphthalein, eg/100 gm) | 0.55-0.56 |
| Acid number (mg KOH/gm) | 313-315 |
| Sp gr (20°/4°C, vac.) | 1.142 |
| Freezing point (°F) | 328-331 |
| Purity (based on acidity, %) | 98.0-99.5 |
| Ash (% by wt) | 0.05-0.15 |
| Solubilities (% by wt @ 20°C): | |
| Water | <0.02 |
| Acetone | 21 |
| Toluene | 9 |
| Octane | ca. 1 |
| Linseed Oil (@ 210°F) | 15 |

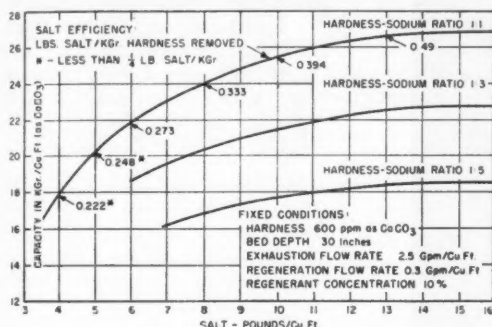


p-*tert*-BUTYLBENZOIC
ACID

Porous structure of resin gives fast ion diffusion, cuts regeneration time

Uses: As a cation exchange resin for applications where a resin having a capacity intermediate between high capacity polystyrene resins and other base exchange products is required.

Features: Porous structure of resin allows rapid diffusion of ions, resulting in a high rate of ex-



DUOLITE C-25 CAPACITY AS FUNCTION OF SALT DOSAGE

change and good salt efficiency. Fast diffusion also reduces time and water requirements in regeneration and rinsing. An increment of capacity is gained in using less raw water for rinsing. Volume change is lower than any other resin built of a styrene matrix and of comparable capacity when subjected to the same conditions.

Description: Duolite C-25 is an economical polystyrene cation exchange resin, combining high porosity with structural integrity. Volume change under ionic pressure is low, and illustrated below:

Index of Volume Changes

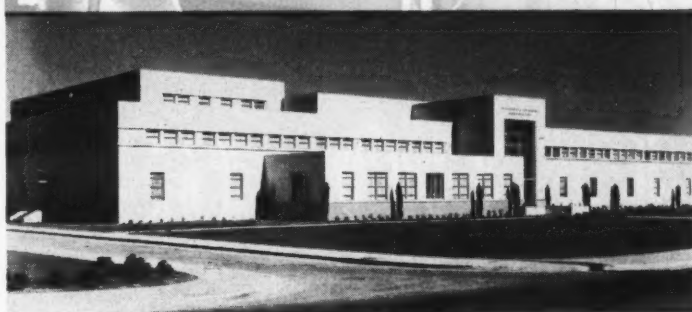
| Brine concentration (%) | 5 | 10 | 15 |
|-------------------------|-----|-----|------|
| Index of resin volume | | | |
| B S & D (exhausted) | 100 | 100 | 100 |
| Under brine | 95 | 90 | 88.5 |
| After rinse | 100 | 100 | 100 |

A brine solution of 10% concentration produces optimum capacity at various salt dosages. Brine concentrations higher than 15% cause a decrease in resin capacity.

Resin is shipped moist and in the sodium state. Gross shipping weight averages 50 lb per cu ft.

(Polystyrene cation exchange resin is a product of Chemical Process Co., Dept. CP, 901 Spring St., Redwood City, California . . . or for more information reader may simply check CP 3354 on the convenient Reader Service slip which is located between pages two and three.)

Continuous research develops better product quality for you



Oronite's product research headquarters, Richmond, California

Oronite ALKANE

by the world's largest producer of synthetic detergent raw materials

Oronite's continuous multi-million dollar research and product development program results in a continually advanced Alkane. Current Oronite Alkane provides a higher yield, is also easier to sulfonate. The sulfonated product has a better color with a minimum oil content. A further Oronite achievement aids in drying the end product at higher production rates.

It costs you no more to do business with the leader. If you are a volume user or seller of surface active materials, we have the experience and engineering know-how to accurately estimate your complete needs for sulfonation. You may find the sulfonating process less costly than you think. If you are interested, why not talk it over with us. Contact by phone or letter the Oronite office nearest you.

OTHER ORONITE DETERGENT PRODUCTS

Detergent Slurry • Detergent D-40 • Detergent D-60
Dispersant NI-W • Dispersant NI-O • Wetting Agents



ORONITE CHEMICAL COMPANY

200 Bush St., San Francisco 20, Calif. • 714 W. Olympic Blvd., Los Angeles 15, Calif.
30 Rockefeller Plaza, New York 20, N. Y. • 20 North Wacker Drive, Chicago 6, Ill.
Mercantile Securities Building, Dallas 1, Texas



When inquiring check CP 3355 on handy form, pgs. 2-3

*Speaking
of
Quality*

IGEPAL® CO-630

is in a class by itself!

TWENTY YEARS of continuous research by the leading manufacturer of nonionic surfactants, has culminated in this superior 100% active ingredient IGEPAL, which is *tops in performance* because it is *tops in quality*. Consider these new "plus" features:

- Water-White Appearance
- Noticeable Lack of Odor
- Non-Stratifying Liquid
- Sediment-Free

Igepal CO-630 is one of a series of 8 Igepal CO brands that range from the oil-soluble Igepal CO-430 to the extremely hydrophilic Igepal CO-880. A new booklet has been prepared giving complete technical data on this important group of surfactants. Send for it today.

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NAME _____

POSITION _____

COMPANY _____

ADDRESS _____

MATERIALS

Monoclinic zirconium oxide
is 99.2% pure . . .

used in chemical reactions,
polishing, pigmentation

Uses: As a starting material for all zirconium chemicals, as a polishing agent, and as a pigment in plastics, ceramics, glasses, and paints.

Features: In addition to its very high purity, compound has extremely fine grain size.

Description: Monoclinic zirconium oxide is 99.2% pure. Having a monoclinic crystal structure, however, the oxide cannot be used in formed parts. Crystal structure undergoes an inversion and a 7% change in volume at about 1000°C.

(Monoclinic ZrO₂ is a development of Zirconium Corporation of America, Dept. CP, Solon Center Bldg., Solon, Ohio . . . or for more information reader may simply check CP 3356 on convenient Reader Service slip which is located between pages two and three.)

Offers emulsifying wax
in flake form . . .

serves as base for creams and ointments

Ceramol, an emulsifying wax, is being offered in flake form. As a base for producing ointments or creams, it is especially useful in incorporating aluminum, strontium, and calcium salts in such products as depilatories and antiperspirants.

(Emulsifying wax in flake form is a product of Aceto Chemical Co., Inc., Dept. CP, 40-40 Lawrence St., Flushing 54, N. Y. . . or for more information check CP 3357 on convenient Reader Service slip which is located between pages two and three.)



For more information on product at left, specify CP 3358 . . . see information request blank between pages 2-3.

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CP

Resin makes glass fiber laminates that stand up well in hot water

Uses: As a laminating resin for glass fiber structures.

Features: Its glass fiber laminates are superior in strength retention properties after exposure to



"These plastic kettles sure make cooking a pleasure!"

boiling water, dilute acid, or alkali solutions. Resin can be promoted and catalyzed so that it will cure at low temperatures.

Description: A low viscosity styrene monomer modified polyester resin, Laminac 4111 has relatively great chemical resistance. For uses requiring high alkaline resistance, tests should first be conducted under actual conditions of exposure.

(Modified polyester resin is a development of American Cyanamid Co., Dept. CP, 30 Rockefeller Plaza, New York 20, N. Y. . . or for more information check CP 3359, pages 2 and 3.)

Made from nylon molding powder, products resist UV degradation, withstand outdoor exposure . . .

readily molded jet black resin has good gloss

Uses: For nylon products in applications involving outdoor exposure, such as the agricultural, automotive, and marine hardware fields, sporting goods, toys, and electrical equipment.

Features: Resin resists ultraviolet degradation and will withstand prolonged outdoor exposure. It is readily moldable with good gloss, free from smears and dull spots.

Description: Nylon molding powder, Zytel 105 BK-10, is jet black in appearance, and has physical properties similar to Zytel 101, general purpose nylon.

(Nylon molding powder is a product of Polychemicals Dept., E. I. du Pont de Nemours & Co., Inc., Nemours Bldg., Wilmington 98, Del. Check CP 3360 on handy form, pages 2 and 3.)

PROGRESS THRU RESEARCH . . . at GENERAL MILLS

Polyamide Resins Prove Versatile in More Durable Coatings, Tighter Seals, Cheaper Laminates, Tougher Welds

Blending General Mills' Polyamide Resins 100 or 115 with epoxy resin has opened a whole new field of uses. Though both components are thermoplastic the blends emerge as thermosetting compositions.

The reactive Polyamide and epoxy resin blends make adhesives of great strength and versatility—highly resistant to mechanical shock, heat and chemical action. These adhesives bond like and unlike, porous and non-porous materials; wood, metal, glass, leather, plastic, rubber, paper, neoprene and fabric.

By varying the ratio of Polyamide to epoxy resin, it is possible to vary the properties of the cured mixture. Generally high Polyamide content gives greater softness and greater



Glass, wood, plastic, metal and leather are bonded above with a blend of General Mills Polyamide Resin and epoxy resin. Tensile shear strength is 2,500 lbs./sq. in. on aircraft aluminum.

toughness, whereas high epoxy content gives increased hardness. They cure well (having low exotherm and shrinkage), have high dielectric strength, and are water and alkali resistant.

Because of these and other properties, new uses already include: enamel coating for wood and metal products, structural adhesives, container sealing and caulking, overprint varnish, electrical insulation, fabric and glass-fiber laminations, and potting and casting compounds.

| POLYAMIDE RESIN | DESCRIPTION | PROPERTIES | RECOMMENDED USES |
|-----------------|--|---|--|
| 90 | Hard, flexible resin at about 180° C; thermoplastic; insoluble in most common solvents; average Mol. Wt. 6000-9000. | Resistant to water, strong alkalis, acids, oil, grease and most chemicals. Soluble in hot alcohol and hydrocarbon mixtures. Gels most solvents at extremely low concentrations at room temperature. | Metal-to-metal welds (combined with Polyamide Resin 100); very small quantities markedly raise the melting point of other Polyamide Resins; forms a solder replacement when filled with aluminum powder. |
| 93 | Hard, flexible resin; melting at 105-115° C; soluble in alcohol and hydrocarbon mixtures; thermoplastic average Mol. Wt. 6000-9000; slightly higher viscosity, weight and toughness than 94. | Excellent heat-sealing; non-yellowing; good glass; moisture vapor resistance; good heat stability at high temperatures. Provides excellent barrier to oils and greases. | Solvent coatings; hot-melt applications; heat seal adhesives; fire retardant paints; aniline and rotogravure inks; coatings for transparent packaging materials; overprint varnishes. |
| 94 | Similar to 93 with lower viscosity; lower Mol. Wt. 3000-6500. | Same as for 93. | Same as for 93. |
| 95 | A form of Polyamide Resin 94, compounded for paper coating—improved sealing, blocking properties, and resistance to moisture vapor transmission. | Miscible with Polyamide Resins 90, 93, 94 and 100 for formulation of heat seal coatings with excellent flexibility and MVT resistance; heat seals at 80-100° C. | Hot-melt or solvent coatings with excellent decorative and heat sealing properties. |
| 100 | Soft, sticky resin melting at 43° C. minimum. | Pressure sensitive. Combined with Epoxy Resins to form hard, abrasion resistant, yet flexible thermosetting blends. Plasticizer; tackifier and modifier for various other resins. | Metal-to-metal welds (combined with Polyamide Resin 90). When blended with epoxy resins, Polyamide Resin 100 forms decorative and protective coatings for paper, wood and metal; enamel coatings; overprint varnishes. |
| 115 | Soft, sticky resin more fluid than Polyamide Resin 100; also more reactive with Epoxy Resin. Pourable at 75° F. or higher. | Reacts with Epoxy Resins in the same manner as Polyamide Resin 100. May be used in or without solvent. | Same as Polyamide Resin 100; also useful with fluid epoxy resins in casting, potting and laminating applications and non-solvent adhesive applications. |

When Used Alone, thermoplastic Polyamide Resins give high-gloss coatings of great flexibility and moderate scuff resistance.

They are used often as adhesives or coatings for paper labels, metal foils, cellophane, shoes, packaging, book and magazine covers, and many other materials . . . often substituting for more expensive coatings and plastic laminations.

Polyamide Resins may be applied by either hot melt or solvent solution. And, they may be modified for higher or lower melting point, greater flexibility, or added tackiness for adhesives.

☆☆☆☆

Polyamide Resins are characterized by non-volatility, sharp melting points, and resistance to moisture,

alkalis, mild acids, grease and oil, and most common chemicals.

You can get General Mills Polyamide Resins uncompounded (for adding plasticizers, waxes or other resins) or compounded (for improved sealing properties and resistance to blocking and water vapor).

They are virtually non-volatile and have very little odor. Also, in several years of research work, no toxic effects have been noted.

Polyamide Resins 90, 93, 94, and 95 are furnished by General Mills in non-returnable fiber drums . . . net weight about 175 lbs. . . in both LCL and carload quantities. Polyamide Resins 100 and 115 are packed in open-top steel drums. Solutions of number 100 are available at 60% solids.

PROGRESS THRU RESEARCH

General Mills CHEMICAL DIVISION KANKAKEE, ILLINOIS

Please send me technical information for the products checked below.

Polyamide Resins: ☐ 90 ☐ 93 ☐ 94 ☐ 95 ☐ 100 ☐ 115

Name

Firm

Address

City State

SEND THIS COUPON:

When inquiring check CP 3361 on handy form, pgs. 2-3



Save time with quick-dissolving HOOKER SODIUM SULFIDES

get clear solutions in 15 minutes

Your production men can work fast with these Hooker sulfides.

The flakes dissolve in 15 minutes, even without stirring—and in cold water. They give a clear solution, free of sediment—ready for immediate use, with no decanting.

Hooker sodium sulfide is a light buff-colored material in flake or solid form. It contains 60 to 62% Na_2S . Flake form is shipped in lacquer-lined steel drums, 90 and 350 lbs. net. Solid form comes in steel drums, 625 lbs. net.

Hooker sodium tetrasulfide is a dark red aqueous solution con-

taining 40% by weight of Na_2S_4 . The solution contains less than 1% sodium thiosulfate, sodium carbonate, and sodium sulfite inclusive. It is shipped in 55-gal. steel drums, 600 lbs. net.

Hooker sodium sulfhydryte, a light lemon-colored solid in flake form, is completely and rapidly soluble in water and alcohol. It is an exceptionally pure material containing 70 to 72% NaSH . It is supplied in lacquer-lined steel drums, 90 and 350 lbs. net.

Before re-ordering your requirements, get the facts on these high-purity sulfides. Just phone

the nearest Hooker office listed below. For technical data, mail the coupon today.

Using sulfur compounds? These are only three of a selection of sulfur compounds available in volume. We've specialized in sulfur-chlorine products for more than a quarter of a century; can help you with your requirements for sulfur chlorides and oxychlorides, and organic sulfur compounds as well. If you need a special sulfur-containing compound in quantity, we may be able to produce it economically for you. To find out quickly, just phone the nearest Hooker office or write us today.

For fast service, phone: CHICAGO Central 6-1311
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Please send data sheets on:

- ☐ Sodium Sulfide ☐ Bulletin 100 describing Hooker products and services
☐ Sodium Sulfhydryte
☐ Sodium Tetrasulfide

Name..... Title.....

Company.....

Address.....

City..... Zone..... State.....

MATERIALS

As a chemical intermediate, molybdc oxide is gaining increasing interest . . .

used also in production of molybdenum catalysts

Uses: As the basic raw material for production of sodium and ammonium molybdates, and nearly all other molybdenum chemicals. It is one of the principal materials used for production of molybdenum catalysts. In fertilizers, it supplies the element to crops; in ceramic enamels it promotes adherence; and in tint titania opacifiers, glasses, and ceramic glazes it lowers surface tension of the silicate melt.

Features: Element has high complexing power, especially in higher valences where it forms complex inorganic salts with almost every known element. It forms numerous complexes and some compounds with organic chemicals. Certain halides and oxihalides can be used as intermediates for synthesis of organomolybdenum and other compounds.

Description: Molybdc oxide, MoO_3 , is produced by roasting molybdenite concentrate. Technical grade is about 90% oxide. On purifying by sublimation, 99.5% pure MoO_3 is obtained.

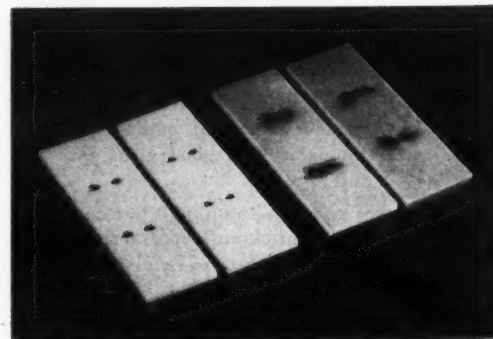
(Molybdc oxide is a product of Climax Molybdenum Co., Dept. CP, 500 Fifth Ave., New York 36, N. Y. . . or check CP 3363, pages 2 and 3.)

Arc resistance, electrical properties of modified melamine laminates opens many applications . . .

laminates can be machined with standard tools

Uses: In electrical applications such as transformers, television and radar insulation, circuit breakers, switch bases, and supports for sliding contacts.

Features: Laminate has excellent arc resistance



After test (5 arcs at 15 kv, 30 ma, $\frac{3}{8}$ " gap, 113 arcs/min), modified melamine laminates (left) show less effect than NEMA Grade XX phenolic samples (right)

When inquiring check CP 3362 on handy form, pgs. 2-3

FOOTE

LiOH

"Heavy Chemical" of the Lithium Industry

Highly reactive with other compounds, versatile and easy to handle, lithium hydroxide is the basic, low cost lithium salt for industrial use.

As an ingredient in ceramics, multi-purpose lubricants, electric storage batteries, and numerous other applications, lithium hydroxide and its derivatives afford sometimes paradoxical, yet uniquely valuable properties.

"Industry Looks at Lithium," a recently published booklet, points up the significant advances that have been made by utilizing these characteristics. We invite you to explore the potentialities of lithium by applying these unique properties for the benefit of your own products or processes.

Write for information.

Foote

MINERAL COMPANY

441 Eighteen W. Chelton Building
Philadelphia 44, Pa.

When inquiring check CP 3364
on handy form, pgs. 2-3

NOVEMBER, 1954

MATERIALS

and electrical properties, and it can be machined readily using standard tools. In addition, moisture resistance is very good.

Description: Phenolite Grade Y-2401 is a paper-base electrical grade plastic, bonded with a polyester-modified melamine resin. Specimens $\frac{1}{8}$ " thick have the following typical physical properties:

| | |
|--|--------|
| Flexural strength (lengthwise, as received; psi) | 24,800 |
| Impact strength (lengthwise, as received; ft lb/in) | 0.48 |
| Sp gr | 1.35 |
| Rockwell hardness ("M" value, 1/16" thick specimen, cold) | 108 |
| Water absorption (E-1/105 followed by D-24/23; % gain) | 0.62 |
| Dielectric strength (perpendicular to laminations, short time, in oil; vpm) | 585 |
| Dissipation factor (as received, @ 1 mc) | 0.0298 |
| Dielectric constant (as received, @ 1 mc) | 4.21 |
| Arc resistance (No. of arcs @ 15 kv, 30 ma, $\frac{3}{8}$ " gap, 113 arcs/min) | 17* |

*Paper-based laminates of Grade XX and Grade XXX gave 6 and 7 arcs, respectively

The laminates can be machined readily. Thicknesses up to $\frac{1}{8}$ " can be punched and sections up to $\frac{3}{8}$ " shaped by shaving dies. It is not necessary to use carbide-tipped tools for drilling, turning, sawing, or milling. Laminates are available in 39 x 47" sheets ranging in thickness from 1/32" to one inch. Color is ivory, and finish is semi-gloss.

(Modified melamine laminate is a development of National Vulcanized Fibre Co., Dept. CP, Wilmington, Del. . . . or for more information reader may simply check CP 3365 on the convenient Reader Service slip which is located between pages two and three.)

Shows methoxychlor use in aerosol and oil-based insecticide sprays

Prepared for processors and manufacturers of aerosol sprays, 11-page bulletin gives up-to-date information on use of methoxychlor in aerosol and oil-based insecticide sprays. Knockdown data and formulation suggestions in general contact and space sprays (as well as in aerosol dispensers), common livestock sprays, and pressurized cattle sprays are presented. Technical data on solubility, solvents, and emulsifiers are included.

Bul "90% Technical Methoxychlor Oil Concentrate Fly Sprays and Aerosols" is issued by Grasselli Chemicals Dept., E.I. duPont de Nemours & Co. (Inc.), Dept. CP, Wilmington 98, Del. When inquiring specify CP 3366 on handy form, pages 2 and 3.

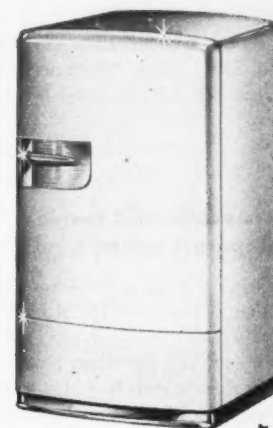
THE ODD CARBON MAKES PELARGONIC ACID DIFFERENT

for example: **Emfac[®]**

Pelargonic Acid

Improves High-Bake

Enamels 4 Ways!



In this use in alkyd resins, the unique properties of pelargonic acid result in four distinct advantages over lauric and other coconut derived fatty acids. In addition to faster cooking of the resin itself, films of white enamel made from pelargonic acid are harder, exhibit higher gloss, and possess greater resistance to yellowing.

As in the application above, Emfac Pelargonic Acid may give your product just the competitive advantage you've been striving for . . . or, it may be the answer to a possible problem of stability, melting point, solubility or consistency. Why not check this C₉ saturated, liquid, monobasic acid and see if it can give you a competitive advantage.

Write for sample or mail coupon
for descriptive literature.

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Plastolein Plasticizers
Twitchoil Oils, Emulsifiers

Emery Industries, Inc.
Dept. CP-11, Carew Tower
Cincinnati 2, Ohio

Please send me literature checked below:
☐ Technical Bulletin on Pelargonic Acid
☐ Use of Pelargonic in High-Baked Enamels

Name..... Title.....
 Company.....
 Address.....
 City..... State.....

When inquiring check CP 3367 on handy form, pgs. 2-3

**Uses, properties, shipping information
on industrial chemicals, specialties**

Alkalies, solvents, phosphates, magnesia and barium products, agricultural products, other chemicals, and specialties are listed in 104-page catalog. Uses, properties, and shipping information are presented. Included is a section containing tables and graphs on solubilities and densities and concentrations of aqueous solutions of many of the chemicals. A brief history of the company is also presented.

Catalog of chemicals is issued by Westvaco Chemical Div., Food Machinery & Chemical Corp., Dept. CP, 161 E. 42nd St., New York 17, N.Y.

**Offers economical source
of propargyl alcohol**

Propargyl alcohol in 40% aqueous solution offers an economical source of the alcohol for reactions which can be conducted in presence of water, such as oxidative coupling for form hexadienediol, and hydration to form acetol. It is also useful when the alcohol is used to inhibit corrosive action of HCl on steel. Compound is offered in pilot plant quantities.

(Propargyl alcohol solution is a product of Commercial Development Dept., General Aniline & Film Corp., Dept. CP, 435 Hudson St., New York 14, N. Y. or for more information reader may simply check CP 3368 on the convenient Reader Service slip which is located between pages 2 and 3.)

**Reduces aldehydes, ketones
in alcoholic, aqueous,
or amine solution**

Uses: As a reducing agent for metals or the carbonyl group of aldehydes, ketones, and acid halides.

Features: Compound is useful under conditions where lithium aluminum hydride is not applicable; for example, in aqueous, alcoholic, or amine solutions. It is particularly useful when it is desired to reduce an aldehyde or ketone group in the presence of other reducible groups such as $-\text{COOEt}$, $-\text{CN}$, and $-\text{NO}_2$.

In aqueous solution, compound reduces to the next lower stable valence Ce^{+4} , Cr^{+6} , Fe^{+3} , Hg^{+2} and Hg^{+2} , and Tl^{+3} and Tl^{+2} . Many other salts are reduced or precipitated as borides or mixtures. Iron can be analytically determined by reduction to Fe^{+2} .

Description: Sodium borohydride, NaBH_4 , is supplied as a 90% pure white to brown-white microcrystalline powder. Reduction potential is -0.43 volts in acid solution; -1.37 volts in basic

for your information...

brief summaries of helpful product news



Six Bulk Stations for Plasticizers Give Monsanto Customers Speedier Deliveries

Monsanto's sixth bulk plasticizers station has been established at Greensboro, North Carolina. The new station is part of the company's program to provide faster tank truck delivery and greater selection for plasticizer customers.

The new station is strategically located in the heart of the rapidly growing plastics industry of the Southeast. It will enable customers to obtain greater versatility and economy in compounding by selecting their plasticizers from Monsanto's large assortment at tank truck and tank car prices. Compartment tank trucks are available.

Other bulk stations are located at Perth Amboy, New Jersey; Everett, Massachusetts; Akron, Ohio; St. Louis, Missouri; Los Angeles, California.



Tests Show Aroclors Lengthen Life of Lindane

A marked increase in the effective insecticidal life of lindane results when chlorinated polyphenyls are used in formulation, according to recent information released by the U. S. Department of Agriculture.

In a series of laboratory and preliminary trial studies it was found that specific chlorinated polyphenyls can be used to give either "tacky" or "dry" deposits, as desired.

These chlorinated polyphenyls, made by Monsanto under the name Aroclors,* have good solvent action on lindane and help to improve the appearance of the pesticidal residue. They also function as relatively non-volatile, nonoxidizable, nonflam-



Research Chemist's Corner

TWO MORE ACRYLONITRILE DERIVATIVES

[Previously announced were: Succinonitrile (pilot plant quantities)
beta, beta' - Thiodipropionitrile (research samples)
beta, beta' - Oxydipropionitrile (research samples)]

Use the handy coupon for further details, or ask for the large "acrylonitrile tree" wall chart showing the derivation of scores of new compounds from acrylonitrile.

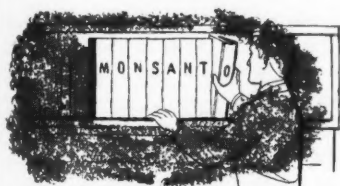
| | beta-CHLOROPROPIONIC ACID $\text{Cl}-\text{CH}_2\text{CH}_2\text{CO}_2\text{H}$ | beta-CHLOROPROPIONITRILE $\text{ClCH}_2\text{CH}_2\text{CN}$ |
|--------------------------------|--|--|
| Formula: | | |
| Approximate Properties: | | |
| Appearance and Color: | White crystalline solid | Colorless liquid |
| Boiling Point: | 204° C. (decomp.) | 176° C. (decomp.) |
| Crystallization Point: | 40.7° C. | -52° |
| Assay: | 99+ % | 98+ % |
| Nature of Impurities: | Acrylic acid, H_2O | Acrylonitrile, water, HCl |
| Stability: | Slow decomposition above 180° C. | Slow decomposition above 130° C. |
| Solubility in common solvents: | Very soluble in alcohol, water, ether | Miscible with acetone, benzene, ethanol, carbon tetrachloride. Solubility in water at 25° C. is 4.5 g/100 g. |
| Chemical Properties: | The chlorine atom is activated by the carboxyl group. The acid may be converted by SO_2 to alpha-sulfoacrylic acid or demuriated to acrylic acid. Exhibits normal carboxylic acid reactions of esterification, etc. | The chlorine atom is activated by nitrile group and is easily replaced. High temperatures or bases demuriate it to acrylonitrile. Otherwise the compound exhibits typical nitrile reactions. |

Laboratory samples available to qualified chemists.

mable bonding agents for lindane, imparting strong adhesion to all surfaces and reducing the evaporation of lindane to a marked degree.

High resistance of Aroclors to water and corrosive influences probably accounts for the unusually good weather durability of lindane-Aroclor noted in preliminary work.

Tests with Aroclors were conducted on both roaches and house flies. According to preliminary results, all indications point to a probable increase in the effective life of lindane of ten to twenty times. For more information on Aroclors, please send in the coupon.



from the MONSANTO BOOKSHELF

A new bulletin on diisodecyl adipate plasticizer (DIDA) is now available from Monsanto. This bulletin contains a description of the product and lists major physical properties. It also gives specifications and goes into detail on the application of DIDA in polyvinyl chloride.

The low volatility and exceptional flexibility imparted to vinyls by DIDA make it well suited for garden hose, free film and sheetings, coated fabric and similar applications.

To receive your copy of this useful new bulletin clip the coupon and mail it today.

A new and comprehensive 63-page booklet on Monsanto plasticizers has been published recently.

The new booklet consists of five major sections. The first section gives general background information on plasticizers.

The second section covers important factors to be considered in choosing the right plasticizer for the job. In this section, various types of plasticizers for vinyl resins, thermosetting resins, cellulose and other resins are discussed.

The third section gives extremely valuable information concerning application data on various plasticizers. The remaining two sections list detailed material on specific Monsanto plasticizers.

To receive your copy of this booklet write on your company letterhead to Monsanto.

New Phenol Decal for Use on Tank Cars

As another step in its program of customer service, Monsanto has mounted a large decal on its tank cars of phenol.

This handsome and attractive decal acts as a safety aid to persons unloading the car and gives them essential unloading instructions.

These instructions are itemized in seven steps. This, plus other information, is contained in Monsanto's pocket booklet which covers the handling of phenol in detail.

Monsanto makes this decal avail-

able to you. Displayed in your unloading area, it can serve as a practical safety reminder. To obtain one of these decals, just check the coupon and mail to Monsanto.



Quick Facts on Pydraul

Pydraul* F-9 is the proved fire-resistant hydraulic fluid, ideal for use in the chemical processing industry wherever the danger of fires exists near hydraulic lines.

When tested by spraying through an oxyacetylene torch, Pydraul will not support combustion. Moreover, users prefer Pydraul because it also has several extras . . . it is noncorrosive, highly stable, an excellent lubricant, and can be re-used again and again without loss of lubricating characteristics.

To find out more about this fire-resistant hydraulic fluid today send in the coupon.



*Reg. U. S.
Pat. Off.

MONSANTO CHEMICAL COMPANY 11/54
1702 South Second Street, St. Louis 4, Missouri

Please send:

- | | |
|--|---|
| <input type="checkbox"/> Booklet "The Aroclors" | <input type="checkbox"/> beta-Chloropropionic acid data sheet |
| <input type="checkbox"/> DIDA Bulletin O-113 | <input type="checkbox"/> Acrylonitrile wall chart |
| <input type="checkbox"/> Phenol tank car decal | <input type="checkbox"/> Succinonitrile bulletin |
| <input type="checkbox"/> Pydraul booklet | <input type="checkbox"/> beta, beta'-Thiodipropionitrile data sheet |
| <input type="checkbox"/> beta-Chloropropionitrile data sheet | <input type="checkbox"/> beta, beta'-Oxydipropionitrile data sheet |

Name..... Title.....

Company.....

Street.....

City..... Zone..... State.....

solution. Compound is stable in dry air to 300°C, and may be handled according to safe practice for flammable hygroscopic powders (such as CaCl_2).

Hydride reacts slowly with water at room temperature, rapidly at 50°C or in presence of acids, Co^{++} , or Ni^{++} . Reaction liberates 2.37 liters of hydrogen per gram of hydride.

(Sodium borohydride is a product of Metal Hydrides Inc., Dept. CP, 12-24 Congress St., Beverly, Mass. . . . or for more information check CP 3370 on handy form, pages 2 and 3.)

Emulsion paints pigmented easily and economically by stir-in colors . . .

washability of the final product is not affected

Uses: For pigmentation of all types of emulsion paints, such as those made of butadiene-styrene, polystyrene, acrylic, and polyvinyl acetate polymers.

Features: Pigments are designed for applications where it is desired to save cost of grinding the pigment or grinding facilities are not available. Pigments represent most economical selection attainable in consideration of good light-resistance, hiding power, and alkali stability. They will not affect washability of final paint as they contain only enough surface-active agent to aid in wetting the pigment and dispersing it into the emulsion vehicle.

Description: Stir-In Pulp Colors are homogeneous mixtures of pigment and water, and are available in yellows, reds, green, and blue. Pigments will not settle out during normal storage. Stir-in advantage is based primarily on physical condition, not on surface-active content.

(Pulp colors for emulsion paints are products of Pigment, Color and Chemical Div. of The Sherwin-Williams Co., Dept. CP, 300 W. Lake St., Chicago 6, Ill. . . . or for more information reader may simply check CP 3371 on convenient Reader Service slip which is between pages two and three.)

Looking for a chemical raw material or intermediate? . . .

The alphabetical Product Directory (pages 213 to 216) will help you find it in a hurry. This listing, started by CHEMICAL PROCESSING in 1938, "puts the finger" on all subjects and products in editorial columns and advertisements of each issue.

When inquiring check CP 3369 on handy form, pgs. 2-3



Dependable Source for Chemical Raw Materials



Elmer Luckow (right), chief soap chemist for the Allen B. Wrisley Co., discusses benefits of Pluronic F68 with William Lieb

"Our 12-year search ended when we learned about Pluronic F68"

— William Lieb, chief cosmetic chemist, Allen B. Wrisley Co., Chicago

"For 12 years we searched for a nonionic, low-foaming, nonirritating surface active agent in solid form," says Chief Cosmetic Chemist William Lieb, Allen B. Wrisley Company, Chicago, makers of fine soaps and toiletries since 1862.

"We tested literally hundreds of products. None of them filled the bill. Then the Wyandotte representative suggested Pluronic F68. We found it fitted our needs exactly. There is no way of measuring in dollars the value of a development like this.

"We use other Wyandotte products, too. As a matter of fact, we

have been buyers of Wyandotte Soda Ash and Caustic since World War I. Deliveries have always been prompt; quality excellent. Wyandotte is big enough to handle our largest orders and give us expert technical assistance, yet small enough to provide personalized service and attention. We are well satisfied."

How about your business? Can you benefit by using some of Wyandotte's many products? Can you profit through Wyandotte's far-reaching developmental program and cooperative technical service? Contact our nearest district office,

or write Wyandotte . . . we're glad to be of service. Samples of Pluronic* F68 are available upon request. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.*

*REG. U.S. PAT. OFF.



HEADQUARTERS FOR ALKALIES

Soda Ash • Caustic Soda • Bicarbonate of Soda • Chlorine
Calcium Carbonate • Calcium Chloride • Glycols • Synthetic
Detergents • Agricultural Insecticides • Soil Conditioners
Other Organic and Inorganic Chemicals

MATERIALS

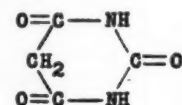
Acts as chemical intermediate for substituted barbiturates, purine derivatives

Uses: As a chemical intermediate in synthesis of certain purine derivatives, substituted barbiturates, and other compounds whose syntheses are dependent upon the pyrimidine structure.

Features: Monoalkyl barbituric acids can be prepared by reacting aldehydes or ketones with the compound, and following by hydrogenation. Substituted barbituric acids can be made by reacting barbituric acid with cyclic α -hydroxymethyl ketones. With α -aminoazo compounds, acid forms riboflavin. Allylhalides react with alkali solutions or suspensions of the acid (in presence of Cu) to produce diallyl barbituric acid. By chromic acid oxidation, alloxan has been prepared. Hydrouacil can be obtained by electrolytic reduction in sulfuric acid solution.

Resinous condensation products may be prepared by condensing barbituric acid with aliphatic aldehydes of low molecular weight in the presence of acid condensing agents.

Description: Barbituric acid is a heterocyclic compound with an active methylene group and two reactive imino groups.



Supplied as a white to yellow-white powder, acid is soluble in ether and in hot water, slightly soluble in alcohol. Specifications of the commercially available compound are:

barbituric acid

| | |
|-------------------------|-------|
| Barbituric acid (% min) | 98.5 |
| Chloride (% max) | 0.020 |
| Ash (% max) | 1.00 |
| Moisture (% max) | 0.50 |

(Barbituric acid is a product of Kay-Fries Chemicals, Inc., Dept. CP, 180 Madison Ave., New York 16, N.Y. . . . or for more information check CP 3373 on handy form, pages 2 and 3.)

Key to YOUR PROBLEM?



"Corrosion Keys" are a part of next month's Corrosion Feature. You'll like this easy-to-use method of finding which alloys and plastics can be used in specific corrosion problems.

When inquiring check CP 3372 on handy form, pgs. 2-3

MATERIALS

Acaricide is compatible with insecticides, fungicides . . .

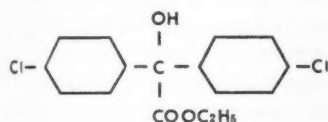
chlorobenzilate is used on agricultural, ornamental crops

Uses: As an acaricide against many species of mites and red spiders on a wide variety of agricultural and ornamental crops.

Features: Formulations have been applied under field conditions with a number of commonly used insecticides and fungicides for test purposes.

Results show a wide range of compatibility with these materials. Good control of mites known to be resistant to some of the organic phosphorus insecticides was obtained.

Description: Chlorobenzilate has this chemical structure:



Pure compound is a yellowish, viscous liquid boiling at 141-142°C (@ 0.06mm Hg). Technical grade is 90% pure and is a brownish liquid weighing 10.7 lb/gal. As hydrated lime retards acaricidal action slightly, formulations with highly alkaline materials are not recommended.

Chlorobenzilate is slightly soluble in water, very soluble in organic solvents. It is available in technical grade, as a 25% emulsion, 25% wettable powder, and as a four per cent dust.

(Acaricide is a product of Geigy Agricultural Chemicals, Div. of Geigy Chemical Corp., Dept. CP, 89 Barclay St., New York 8, N.Y. . . . or for more information reader may simply check CP 3374 on Reader Service slip which is located between pages 2 and 3.)

For more information on product at right, specify CP 3375 . . . see information request blank between pages 2 - 3.

Looking for the vital link

in your formulation problems?

*try
Witco*

A chain of important chemicals to improve your products

CARBON BLACKS • STEARATES • DRIERS • PLASTICIZERS • STABILIZERS

RUBBER CHEMICALS • FUNGICIDES

WITCARBS® (precipitated calcium carbonate)

GELLING AGENTS • WAXES • ASPHALTIC SPECIALTIES

Write us today for technical information and samples for your evaluation.



WITCO CHEMICAL COMPANY

CONTINENTAL CARBON COMPANY

260 Madison Avenue, New York 16, N. Y.

Boston Cleveland Akron Chicago Houston Atlanta Los Angeles
San Francisco London and Manchester, England

The Industries We Serve — PHARMACEUTICALS



W&D-4971

Age: 69 seconds

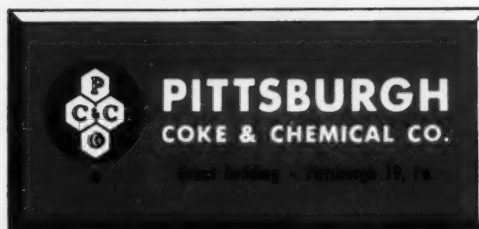
Life Expectancy: 69 years

LUCKY Junior! If he drives his rocket car carefully and doesn't overheat his atomic furnace, he's slated to spend a nice slice of his life in the 21st Century. He won't be haunted by most of today's diseases, that's certain. For medical science, hand in hand with the Pharmaceutical Industry, is already knocking off these killers, one by one. And chemicals from coal are right on the firing line.

Pittsburgh Coke & Chemical Co. is a *basic* producer of many of these vital materials. Some of the first sulfa drugs were made from coal-derived pyridine produced at our plant. Other Pittsburgh coal chemicals are showing bright promise in the experimental treatment of tuberculosis.

To pharmaceutical manufacturers, *Pittsburgh* stands for *purity*. For Pittsburgh coal chemicals are quality

checked from mining to final processing. It's the same story with Pittsburgh dyestuffs, plasticizers, agricultural chemicals and all other products of our ten integrated divisions: Better products for industry and agriculture... because Pittsburgh is *basic*!



COAL CHEMICALS • AGRICULTURAL CHEMICALS • FINE CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

When inquiring check CP 3376 on handy form, pgs. 2-3

MATERIALS

Describes polyamide resins

Prepared by condensation of polymerized unsaturated fatty acids with aliphatic amines, polyester resins are described and applications are presented in 4-page folder. Properties, compatibility with plasticizers, waxes, and resins, and applications are included.

Bul 11-1-2 is issued by Chemical Div., General Mills, Inc., Dept. CP, Kankakee, Ill. When inquiring specify CP 3377 on handy form, pages 2 and 3.

Offers another pair of dyes to textile finishers...

disperse, vat dyes produce shades of pink and yellow, respectively

Antraquinone disperse dye, Nacelan Pink 3B, produces bright shades of pink and bluish red when dyed or printed on acetate rayon. On nylon, colors are somewhat bluer. At higher temperatures or at boil with suitable carrier, it may be used to color Dacron. Dyestuff is fast to perspiration, acid, alkali, water, hot pressing, and light.

Antraquinone vat dye, Carbanthrene Yellow PG Double Paste, produces moderately bright reddish shades of yellow on cotton or rayon. Dyestuff is applicable by all the methods of dyeing in open tubs, continuous range, or package machines. As it is unaffected by presence of metals in dyebath, it can be dyed in iron machines with practically no dulling. Dye is fast to all wet processing, and is recommended for materials to be resin-finished for crease resistance. Light-fastness is increased by such treatment.

(Disperse and vat dyes are products of National Aniline Div., Allied Chemical & Dye Corp., Dept. CP, 40 Rector St., New York 6, N. Y. . . . or for more information check CP 3378 on handy form, pages 2 and 3.)

Functions chemically and physically when used as extender or additive with plastic and rubber...

material flows under heat and pressure, and has low specific gravity

Uses: For loading phenolic molding compounds and rubber products, as an adhesive extender in plywood and furniture industries, and as an ingredient in vinyl products, foundry sand, and asphaltic products.

Features: Material functions chemically as well

as physically when used as a filler, extender, or additive. It flows under heat and pressure without additional ingredients. A low specific gravity increases its economic attractiveness.

Description: Silvacon products are derived from Douglas fir bark by a fractionation method. The three basic components, pliable spongy flakes (cork), needle-like fibers, and amorphous powder, are available in refined and super-refined form. Typical physical properties of three of the Silvacons are given:

| Silvacon | 144 (cork) | 412-G (fiber) | 472 (powder) |
|--------------------------------------|---------------|------------------|-----------------|
| Color | buff | brown | red brown |
| Non-impacted bulk density (lb/cu ft) | 13 | 23 | 18 |
| Sp gr (ultimate) | 1.32 | 1.42 | 1.44 |
| Analyses (%) | | | |
| Cellulose | 15 | 47 | 25 |
| Lignin (sulfuric acid method) | 62 | 45 | 65 |
| Wax | 13 | 5 | 5.5 |
| Flavanol-type compound | 10 | 3 | 4.5 |
| Ash | 0.2 | 0.8 | 2.0 |
| Solubilities (%) | | | |
| Water | 13 | 10 | 21 |
| Ether | 23 | 8 | 10 |
| 2% caustic | 80 | 42 | 78 |

The material may be compounded by simple physical addition, or it may first be chemically combined with 10-30% (by wt) aqueous caustic before process utilization. Latter treatment develops valuable chemical properties not evidenced by simple physical addition.

(Silvacon is a development of Special Products Branch, Weyerhaeuser Timber Co., Dept. CP, Tacoma Bldg., Tacoma, Wash. . . or for more information check CP 3379, pages 2 and 3.)

Catalogs over 3500 organic chemicals

Over 3500 organic compounds are listed in 224-page digest-size catalog. Structural formulas, molecular weights, melting or boiling ranges, and price data are given. Appendices list alkaloids, amino acids, carcinogenic chemicals, sugars, and vitamins; along with compilations of pH indicators, liquids for refractive index determinations, solvents for spectrophotometric use, reagents for analytical and "spot" tests, and stable isotope concentrates of carbon and nitrogen.

"List No. 39" is issued on letterhead request by Distillation Products Industries, Div. of Eastman Kodak Co., Dept. CP, 755 Ridge Rd. West, Rochester 3, N.Y.

Dow Preservatives act as "life insurance" for product quality of many adhesives

*Dowicides A, F, and G
prevent bacterial attack on
adhesives, solve mold growth
and odor problems*



DOWICIDE PRESERVATIVES extend life of often-opened library pastes.

THE DOW CHEMICAL COMPANY
Dept. DP 731C, Midland, Michigan

Please send me further information
on the uses of Dowicide Preservatives.

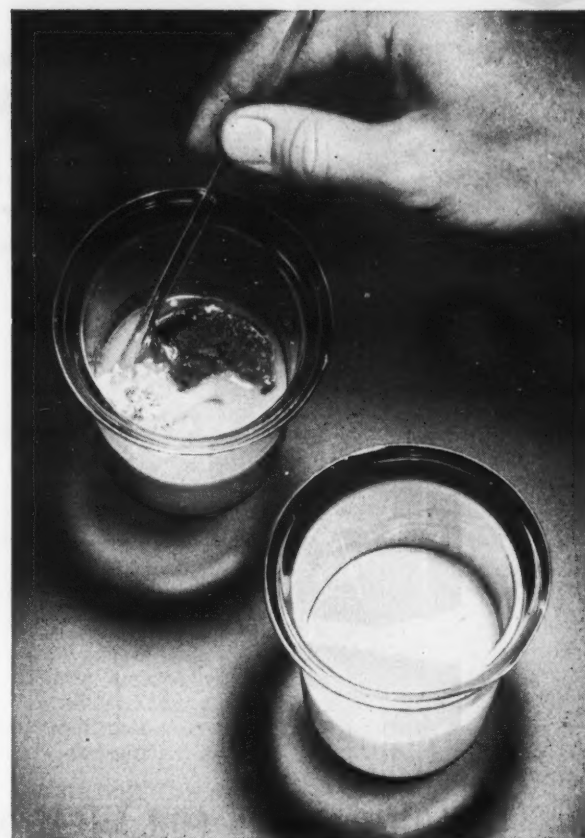
Name _____
Title _____
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Address _____
City _____ Zone _____ State _____

you can depend on **DOW CHEMICALS**

DOW

When inquiring check 3380 on handy form, pgs. 2-3

DOW



DOWICIDE® PRESERVATIVES alone account for this difference in two samples of the same product. Standard industrial adhesive samples were inoculated with microorganisms from a spoiled adhesive, then exposed for one week to a temperature of 86°F. Under these conditions, *untreated* test sample (left, above) has liquefied, shows mold growth, has objectionable odor. Decomposition under bacterial attack has left adhesive without needed properties. Test sample *treated* with Dowicide Preservatives (right, above) resisted such attack—retains proper consistency and all other desirable characteristics.

Fourteen various Dowicide Preservatives currently increase manufacturing efficiency and prolong product quality to the benefit of maker and consumer. They find use in the paint, petroleum, textile, paper and pulp, agricultural, leather, cordage, transportation and other industries. Your processing, packaging or selling operations might be helped materially by one or several Dowicide Preservatives. Dow's laboratories are equipped to analyze preservative problems and to test submitted samples. For detailed information, mail coupon to THE DOW CHEMICAL COMPANY, Midland, Michigan.



QO[®] FURFURYL ALCOHOL

BUILDING BLOCK FOR SUCCESSFUL USES

The shape of successful new uses is molded by the character of the starting chemical. When you start with furfuryl alcohol, look for the unusual. Its unique behavior is the building block for creating new applications.

You don't add strong acids to furfuryl alcohol, unless you want sudden and dramatic reactivity of the alcohol,—reactivity which when properly harnessed leads directly to the production of chemical resistant resins used as mortars reinforced linings, and binders.

With urea adhesives or phenolic binders, furfuryl alcohol acts not only as a solvent, but effects decided and desirable modifications of the final products.

The peculiarities of furfuryl alcohol's reactions in the preparation of simple derivatives such as esters, challenging though they are, are the promise of future successes in chemical synthesis.



Furfural
Furfuryl Alcohol
Tetrahydrofurfuryl Alcohol
Furoic Acid
Fur-Ag[®] Conditioner
Furfil[®] Lignocellulose

Write for Bulletin 205 describing the properties, chemistry and uses of QO Furfuryl Alcohol.

The Quaker Oats Company
CHEMICALS DEPT.

336X The Merchandise Mart, Chicago 34, Illinois
Room 536X, 120 Wall St., New York 5, N. Y.
Room 436X, P. O. Box 4376, Portland 8, Oregon
In Europe: Quaker Oats-Graanproducten N. V.,
Rotterdam, The Netherlands;
Quaker Oats (France) S. A., 3, Rue Pillet-Will, Paris IX, France
In Australia: Swift & Company, Pty., Ltd., Sydney
In Japan: F. Kanematsu & Co., Ltd., Tokyo

When inquiring check CP 3381 on handy form, pgs. 2-3

MATERIALS

Weakly and strongly basic groups synergize weak acid removal by anion exchange resin . . .

low regenerant dosage yields low silica leakage

Uses: As an anion exchange resin for producing electrolytically pure water.

Features: Presence of weakly basic groups in proximity of strongly basic ones has synergistic effect. Weak acids such as silica are removed to an extent which is greater than the removal expected based on salt-splitting capacity. In addition, the large concentration of acid-adsorbing groups give the exchanger extra capacity to remove sulfates and chlorides (strong anions) long after capacity for silica and CO₂ has been exhausted.

Economical to operate, low regenerant dosages yield low silica leakages. Little or no impairment of rinsing characteristics are noted during regeneration phase as exchanger "ages" in service.

Description: Duolite A-41 is a difunctional strongly-basic anion exchange resin, based on an aliphatic matrix. Both tertiary and quaternary ammonium groups are incorporated in the resin during manufacture.

In multiple-bed operations where CO₂ is eliminated by deaeration before feed enters resin, A-41 exhibits extra capacity, as the weakly acetic action of CO₂ for the quaternary ammonium groups has been eliminated.

Resin is available in both granular and bead form, both having similar operating characteristics. Screen analysis of wet particles shows bulk of particles lie between number 16 and 40 screens.

(Anion exchange resin is a product of Chemical Process Co., Dept. CP, P.O. Box 829, Redwood City, Calif. . . . or for more information reader may simply check CP 3382 on convenient Reader Service slip which is located between pages 2 and 3.)

Chemical properties of molybdenum and its compounds discussed

Presented as a guide to the selection of molybdenum products for applications in the chemical process industries, four-page data sheet describes commercially available products, their manufacture and uses. The metal, and compounds including molybdenum disulfide, molybdic oxides, sodium molybdate, and ammonium molybdate are discussed.

Bul Ch-1 is issued by Climax Molybdenum Co., Dept. CP, 500 Fifth Avenue, New York 36, New York. When inquiring reader may simply check CP 3383 on the convenient Reader Service slip which is located between pages two and three.

Problem

To produce more ammonia without excessive expansion of existing facilities.



Solution

GIRDLER helped solve this problem by developing two highly active catalysts, G-19 and G-3. Without sacrificing quality or enlarging the gas plant, the use of these two GIRDLER Catalysts on synthesis gas production resulted in:

75% more output



Girdler specializes in solving catalyst problems. Its knowhow is at your service.

FOR

Catalysts



WRITE...

The
GIRDLER
Company

A DIVISION OF
NATIONAL CYLINDER GAS COMPANY
Gas Processes Division

LOUISVILLE 1, KENTUCKY

NEW YORK • TULSA • SAN FRANCISCO

When inquiring check CP 3384 on handy form, pgs. 2-3

CHEMICAL PROCESSING

**Heat and light stabilizer
is especially suited
for vinyl plastisols**

Uses: As a heat and light stabilizer for vinyl resins, especially plastisols and organosols.

Features: Clarity of plastisol films containing stabilizer is very good and approaches optical clarity if sufficiently high temperatures are used for fusing. Due to low viscosity, air release property of plastisols is improved and entrapped air bubbles are easily released on standing overnight.

Description: One-package liquid barium-cadmium stabilizer, called BC-105, has following specs:

| | |
|-----------------------|--------|
| Color (Gardner Holdt) | 4-5 |
| Sp gr (25°C) | 1.135 |
| Viscosity (cp @ 25°C) | 60-70 |
| Odor | slight |

Light stability of vinyl compounds stabilized with this material have shown no breakdown after 500 hr exposure in Atlas Fadeometer.

Being a liquid, stabilizer can be incorporated in DOP and similar plasticizers, but such dilutions should not be kept for any period of time as separation may occur.

(Ba-Cd stabilizer is a product of Advance Solvents & Chemical Corp., Dept. CP, 245 Fifth Ave., New York 16, N.Y. Check CP 3385, pages 2 and 3.)

**C¹⁴-tagged compounds
in 0.1 millicurie
packages**

C¹⁴-labeled sodium bicarbonate, sodium carbonate, sodium acetate, and glycine are available in 0.1 millicurie packages.

(Radioactive carbon compounds are available from Bio-Rad Laboratories, Dept. CP, 800 Delaware St., Berkeley, Calif. Check CP 3386, pages 2 and 3.)

For more information on product at right, specify CP 3387 . . . see information request blank between pages 2 - 3.

ACRYLO-NEWS

AERO* Acrylonitrile, a highly stable bi-functional chemical, is finding increasing use as a reactive intermediate. Its versatility is indicated by its use in the preparation of pharmaceuticals, insecticides, surface active agents, and many other useful products as well as by direct application in the broad fields of rubber,

plastics and textiles. Its polymers and copolymers can be formulated to add many desirable properties to today's products and to create interesting new products for the future. The following items and abstracts, gathered from many sources, indicate a few facets of current research with this versatile chemical.

★ ★ ★ ★ ★ ★

FABRICS THAT BREATHE, THOUGH IMPERMEABLE TO FLUID, are ideal for apparel, tarpaulins, awnings, etc. This may be achieved by impregnating a glass fiber web with a water-soluble compound, completely filling the voids, after which a continuous coating of an acrylonitrile-butadiene thermoplastic resin is applied. The filler is then removed by water leaving a microporous material.

CELLULOSE REACTS WITH ACRYLONITRILE to form a new group of fibrous and non-fibrous ethers. For example, if cotton is chemically modified with relatively low percentages of acrylonitrile, it acquires such desirable properties as rot proofness, heat resistance and better receptivity to dyes. By introducing larger amounts of acrylonitrile, soluble ethers are formed which are useful intermediates for textile finishes, sizes, emulsifiers and many other processing agents.

APPLICATION OF ACRYLONITRILE COPOLYMERS TO SYNTHETIC FIBERS has been improved through admixture with phenolic resins. Smooth, hard, glossy, flexible coatings, having good adhesion to nylon fibers, may be obtained by combining acrylonitrile-styrene copolymers with alkyl-substituted phenolic resins and a catalyst.

ACRYLONITRILE RUBBERS CONTINUE TO FIND NEW USES. Since the new types of plastic floor coverings are not effectively bonded with water-containing adhesives such as casein and animal glues, an intermediate coating is required. Application of acrylonitrile-butadiene copolymer to the under surface of the floor covering provides excellent bonding with these common types of adhesives.

METHYLENEBISACRYLAMIDE, ANOTHER MEMBER OF THE GROWING *Cyanamid* ACRYLONITRILE FAMILY, is of value as a cross-linking agent. It can be used to link unsaturated alkyd resins to give products with improved thermostability and solvent resistance. In general, methylenebisacrylamide may serve as a bridging agent for compounds containing active hydrogen atoms. Potential applications exist in molding resins, adhesives and coating compounds.

(Some or all of the above items are covered by U.S. or foreign patents)

★ ★ ★ ★ ★ ★

Should you wish a more complete bibliography of current literature and new developments concerning acrylonitrile, we shall be glad to place your name on our mailing list.

As the pioneer producer of this exciting vinyl monomer, American Cyanamid has expanded its production facilities to assure users adequate supplies at low price. Write for technical assistance in your acrylonitrile research.

*Trade-mark

AMERICAN *Cyanamid* COMPANY

PETROCHEMICALS DEPARTMENT
30 Rockefeller Plaza, New York 20, N. Y.

**FOR
"TOP DRAWER"
SERVICE AND
QUALITY...**

**SPECIFY
HEYDEN!**

SUPERFYDE®

(HEYDEN)

A solid polymer of formaldehyde characterized by an extremely low water content, high assay, low reactivity, low solubility, and high melting point. Useful in syntheses requiring formaldehyde, which are prevented or inhibited by traces of water.

CONTAINERS

Superfyde® Powder
Fiber drums, 250, 100, 50, 25 lbs.

PARAFORMALDEHYDE

(HEYDEN)

A solid source of formaldehyde, for manufacturing synthetic resins and as a catalyst for cold-setting adhesives. Also used in fungicides, deodorizers, and photographic chemicals.

CONTAINERS

Paraformaldehyde U.S.P. X
(Powder, Medium Powder, Flo-Granular)
Fiber drums, 250, 50, 25 lbs.

HEXAMETHYLENETETRAMINE

(HEYDEN)

Valuable to the synthetic resins industry in the curing of resins. Used as a chemical intermediate and as a hardening agent for casein, glue and other proteins; as a rubber accelerator; for explosives; for fuel tablets; in medicinals. As an amine, it finds use as a neutralizing or deactivating agent.

CONTAINERS

Hexamethylenetetramine Technical

Granular . . . Multiwall paper bags, 75 lbs.; Fiber drums, 100 lbs.
Powder . . . Multiwall paper bags, 50 lbs.; Fiber drums, 100 lbs.

Hexamethylenetetramine U.S.P.

(Methenamine U.S.P. Powder or Granular)
Fiber Drums, 100, 50 and 25 lbs.

FORMALDEHYDE

(HEYDEN)

Widely used in the production of phenolic, urea, melamine and resorcinol resins; for converting casein, glue and other proteins into plastic products. Increasingly important in manufacture of chemicals and fertilizers. Used in embalming fluids, disinfectants, fumigants, deodorants, and in the leather, fur, paper and textile industries.

CONTAINERS

Formaldehyde Solution N.F.

Tank car 72,000 lbs.
Tank truck 30,000 lbs.
Drums 475; 125; 90 lbs.
Cqrboys 100 lbs.

37% Formaldehyde—Methanol Free

Tank cars 72,000 lbs.
Tank trucks 30,000 lbs.



HEYDEN CHEMICAL CORPORATION

342 Madison Avenue, New York 17, N.Y.

CHICAGO • CINCINNATI • DETROIT • PHILADELPHIA • PROVIDENCE • SAN FRANCISCO

MATERIALS

Thiophosphoryl chloride makes insecticides, lube oil additives

Uses: As a basic intermediate for production of insecticides and lubricating oil additives.

Features: In preparation of phosphorus esters, amides, and anhydrides, reactions are analogous to those of phosphorus oxychloride. In addition, compound may be used to introduce sulfur into phosphates.

Description: Thiophosphoryl chloride, PSCl_3 , is a reactive, colorless, mobile liquid with a characteristic odor. Properties include:

| | |
|---|---------|
| Boiling point ($^{\circ}\text{C}$) | 124-125 |
| Sp gr (25/ 4°C) | 1.630 |
| Vapor pressure (mm Hg @ 25 $^{\circ}\text{C}$) | 22 |
| Refractive index (@ 35 $^{\circ}\text{C}$) | 1.545 |

(PSCl_3 is a product of Westvaco Chemical Div., Food Machinery & Chemical Co., Dept. CP, 161 E. 42nd St., New York 17, N.Y. . . . or for more information check CP 3388 on handy form, pages 2 and 3.)

Study shows effects of storage temp on plastisols

Basic study of effects of storage temperatures on viscosity of plastisol formulations shows DIDP-produced plastisols did not gel after 30 days under conditions simulating severe warehouse and transit temperatures. Tests also indicate similar slow viscosity build-up for plastisols incorporating diisodecyl adipate. Study also confirmed that manufacturer's Santicizers 160 and 141 impart extremely rapid fusion characteristics to such formulations.

(Study was conducted by Organic Chemicals Div., Monsanto Chemical Co., Dept. CP, St. Louis 4, Missouri.)

For more information on product at left, specify CP 3389 . . . see information request blank between pages 2-3.

MATERIALS

Reduced volatility, good electrical and low-temperature properties features of vinyl plasticizers

Uses: As plasticizers for vinyl chloride resins.

Features: Compounds have reduced volatility, improved low-temperature properties, and excellent electrical properties. They are completely compatible with vinyl chloride resins.

Description: Flexols 810 and 812 are higher alcohol phthalate plasticizers, light-colored and chemically stable. When compounded, they are odorless, resistant to water extraction and "rub-off" from upholstery sheeting. In plastisols, Flexol 812 gives lower viscosities than 810.

(Plasticizers for vinyl chloride resins are a product of Carbide and Carbon Chemical Co., a Div. of Union Carbide and Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N.Y. . . . or for more information check CP 3390 on handy form, pages 2 and 3.)

Good light stability, brilliance, ease of fabrication provided by polystyrene plastic

Uses: Plastic will be of particular significance to the lighting field for use in light fixtures, interior display signs, instrument dial faces and panels, and escutcheons.

Features: Formulation offers eight to ten times better light stability than general purpose polystyrene, and possesses brilliance, high clarity, and ease of fabrication.

Description: Styron 647, a light-stable formulation of polystyrene plastic, retains the characteristic physical and chemical properties of the general purpose material. The formulation comes in nonyellowing crystal and white colors.

(Light-stable polystyrene is a development of The Dow Chemical Co., 1000 Main St., Midland, Mich. . . . or for more information reader may simply check 3391 on the convenient Reader Service slip which is located between pages two and three.)

How diatomite powders help insecticides, fertilizers

Folder shows how Celite (an inert diatomite powder) acts as an economical insecticide carrier, and as an anti-caking agent in deliquescent fertilizers.

Bul FA-43A is issued by Celite Div., Johns-Manville Corp., Dept. CP, 22 E. 40th St., New York 16, N.Y. When inquiring specify CP 3392 on handy form, pages 2 and 3.

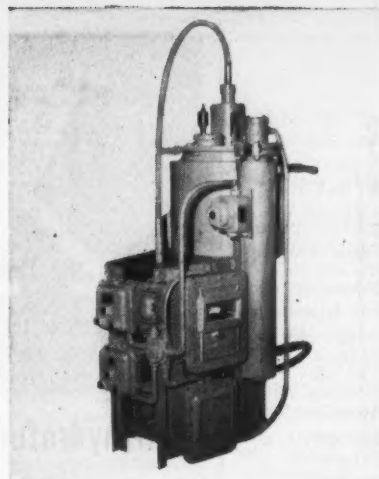


FIGURE 11
One type of pilot plant dispersion unit.



Pouring cool sample of sodium dispersed in high flash point medium illustrates ease of handling. Samples are available for initial investigations.

HOW TO MAKE SODIUM DISPERSIONS

With the development of sodium dispersions, the value of metallic sodium as a reaction tool on a commercial scale has been multiplied many times over. While sodium bricks and molten sodium have been used for years in the manufacture of materials

such as sodium methylate and fatty alcohols, the high reactivity and ease of control inherent in dispersions permits a vast broadening of practical sodium applications.

To test the laboratory or pilot plant value of sodium dispersions in your process is a simple matter requiring little or no investment in equipment. For example, Figure I shows a simple laboratory unit consisting of a creased flask, a special high-speed stirrer, nitrogen purge lines, reflux condenser and addition funnel. Fifteen minutes mixing at 105° C. is generally sufficient to produce good dispersions containing 50% sodium with particles averaging 10 to 20 microns. Subsequent reactions may be carried out in the same equipment, giving high yields under easily controlled conditions.

Figure II shows a 15 gallon pilot plant dispersion unit which handles 20 to 50 pounds of sodium. Modified versions for handling smaller quantities are easily fabricated. The method of preparation and mixing time is quite similar to the laboratory equipment, and the charge consists of brick sodium or molten sodium from a melt tank. Units up to 500 gallon capacity have been put into operation.

Our technical service people

will be glad to work with you on modifications of equipment already available in your laboratory or pilot plant, and will supply complete information on dispersion preparation and use. In addition, we offer a booklet, "Sodium Dispersions", which tells you how to make and use these dispersions in many reactions, such as:

- Claisen Condensations.
- Wurtz type reactions.
- Preparation of sodium alcoholates.
- Purifications.
- Preparation of organo-sodium compounds.
- Metalations.
- Replacement of active hydrogen by sodium.
- Polymerizations.

Metallic sodium is manufactured by National Distillers Chemical Co., at Ashtabula, Ohio, and sold by U. S. Industrial Chemicals Co. (both divisions of National Distillers Products Corp.) 99 Park Avenue, New York 16, N. Y. Branches in all principal cities.

Please send me your booklet, "SODIUM DISPERSIONS". I am interested in sodium for

Name _____

Firm _____

Address _____

U. S. INDUSTRIAL CHEMICALS CO.

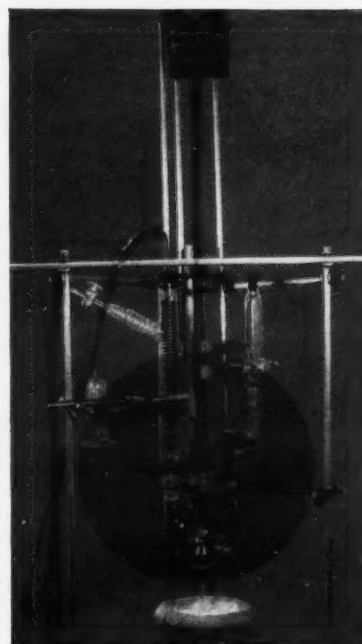


FIGURE I
One type of laboratory dispersion unit.

When inquiring check CP 3393 on handy form, pgs. 2-3

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SERVICE
UNIFORMITY**

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|---------------|----------|-----------|
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| | PALMITIC | |
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| CAPROATE | ELDO 18 | CAPRYLATE |
| CAPRATE | COCONATE | LAURATE |
| MYRISTATE | | PALMITATE |

For samples and specifications, write
Dept. P

Rely on



OIL WORKS
Main office:
PO Box 599, Oakland 4, Calif.
Plants:
Bayonne, N. J., Oakland, Calif.

When inquiring check CP 3394
on handy form, pgs. 2-3

MATERIALS

Stabilizes PVC formulations against heat and light . . .

Ba-Cd stabilizer finds use in rigid, plastisols

Uses: As a heat and light stabilizer for opaque or transparent formulations of polyvinyl chloride.

Features: Stabilizer retards haze formation and discoloration on prolonged exposure to high temperatures and UV radiation. It is especially efficient in PVC polymers and copolymers of varying molecular weight and when used in calendering, extrusions, solutions, organosols, or plastisols. Very small amounts of additional releasing agents are necessary with the powder form.

Description: Stabelan HR Powder is a white, practically odorless powder composed of barium and cadmium mixed fatty acid esters. Specific gravity of the powder is 1.13 ± 0.02 . Stabilizer is also available in liquid form, having a sp gr of 1.08 ± 0.02 . Liquid should be kept in closed containers and exposed to air only during weighing.

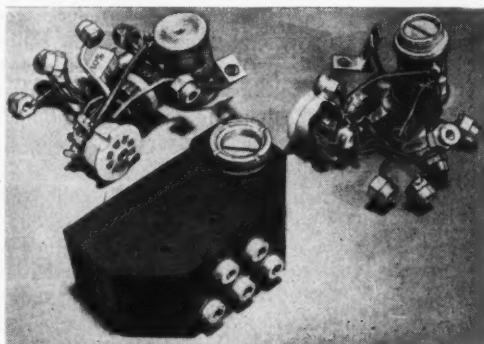
(Stabilizers for PVC are distributed by Harwick Standard Chemical Co., Dept. CP, 60 S. Seiberling St., Akron 5, Ohio . . . Check CP 3395, pgs. 2-3.)

Range of usefulness for casting resin for making electronic embedments is -100° to over 392°F . . .

cured plastic has low coefficient of expansion

Uses: As a casting resin for producing electronic embedments, such as for power transformers, transistors, and complete electronic circuits.

Features: Castings can be subjected to temperatures in the range of -100°F without harmful



Embedments have wide operating temperature range

results because of low temperature coefficient. Upper range is 392°F; and for short periods, temperatures of 500°F can be endured. Other important features are low shrinkage during cure, and good adhesion to a wide range of materials.

Xtracts

USEFUL INFORMATION ABOUT REACTIVE CHEMICALS
FROM THE DU PONT ELECTROCHEMICALS DEPARTMENT.

Tetrahydrofuran—intermediate and powerful solvent

Perhaps better known for its high solvent power, tetrahydrofuran has also promising possibilities as a chemical intermediate. A wide variety of reactions indicate its versatility, for example: ring fission; it can be polymerized by acid catalysts. Other typical reactions:

Oxidation . . . succinic acid

Chlorination
2,3-dichlorotetrahydrofuran

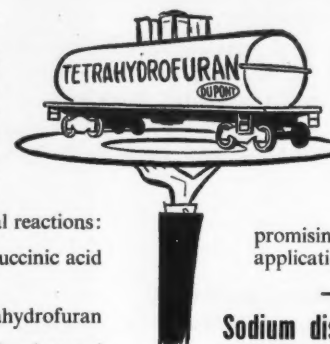
Hydrochlorination . . . 4-chlorobutanol

Acylation . . . esters of 1-4 butanediol

THF is useful in extraction and as a solvent medium, particularly for Grignard, lithium aluminum hydride and sodium acetylide reactions. Its ether structure, stability, low boiling point and solvent capacity point to a promising future for THF in both fields.

The hard-to-dissolve polyvinyl chlorides and vinylidene chloride copolymers used in the plastics field offer a tough test for a solvent. Yet, THF dissolves these high molecular weight materials at room temperature—producing solutions that combine high solids content with practical working viscosities. Improved adhesive compositions for plastics, formulations for printing inks, lacquers for topcoating of plastic sheeting are possibilities because of the superior solvent power of THF.

A colorless liquid, THF is readily miscible with water, ketones and most of the common organic solvents. Mixing with THF improves the solvent power of weaker solvents, and THF-dimethyl formamide mixtures exhibit synergistic solvent powers. At room temperatures, DMF dissolves less than 5% of polyvinyl chloride and THF about 17%. Yet a mixture of 65% THF and 35% DMF will dissolve about 24% polyvinyl chloride. These



solutions don't gel on storage; raising temperature improves solvent power.

Check the coupon for more information about this promising solvent—its uses, applications and properties.

Sodium dispersion speeds reactions, improves yields

Microscopic particles of sodium dispersed in an inert medium offer definite advantages over bulk sodium in many reactions. Yields are better, reactions faster—frequently at lower temperatures.

For example, at about 60°C., using 1/4 to 1/2 inch cubes of sodium, the reaction time for the self condensation of ethyl acetate to yield sodioacetoacetic ester is over 28 hours. Equal yields result in 7 to 9 hours when a sodium dispersion is used—and the reaction temperature may be lowered as much as 10°C.

Sodium dispersions were first developed by Du Pont and are particularly useful in systems where sodium is insoluble. Here, reaction time is a function of the surface area of the sodium, and in dispersion form, a vast area is exposed. Dispersions present no handling problem, since up to 50% sodium content produces no appreciable change in the fluidity of the dispersion medium.

Find out more about sodium dispersions by checking the coupon. A Du Pont booklet will be sent to you which describes how these dispersions are made and where they can be used.

High-purity yields with H₂O₂ in organic synthesis

High-purity yields are possible in organic synthesis when the oxidizing agent is "Albone" hydrogen peroxide. In reacting, hydrogen peroxide is transformed into oxygen and water as by-products; no contaminating salts are introduced. Combined with vigorous oxidizing activity, when properly activated, this feature of "Albone" makes it useful in the preparation of pharmaceuticals, dyes and industrial products. With hydrogen peroxide, methyl naphthalene can be oxidized to the 1,4-naphthoquinone. Double bonded side chains on aromatic compounds are oxidized to aldehyde groups.

An example of the many organic peroxide products made from "Albone" is benzoyl peroxide, used in bleaching flour and grain, as an oxidizing agent, and as a polymerization catalyst.

Organic acids react readily with hydrogen peroxide to form peracids—effective agents for converting olefinic compounds to epoxides or hydroxy compounds. The double bond in maleic acid, for example, can be hydroxylated to form tartaric acid.

For more information about "Albone" hydrogen peroxide, properties and applications, check the coupon.

New Alkali-Soluble Vinyl Polymer

"Elvadex" vinyl polymer is a unique vinyl acetate copolymer which is soluble in alkaline solutions and insoluble in neutral or acidic solutions. It is also soluble in many low-cost organic solvents.

"Elvadex" is useful as an off-loom finish for dope-dyed acetate yarn, warp size for synthetic fibers and for clear, glossy, greaseproof coatings on paper. Other applications include use as a thickener, pigment dispersant, or flow improver for latex paints; as a base for lacquers and aniline-type inks, and as an ingredient of emulsion-type floor wax.


Check coupon for more data.

E. I. du Pont de Nemours & Co. (Inc.)
11507 Nemours Bldg., Wilmington, Del.

Please send me literature and information on:

- ☐ Tetrahydrofuran
- ☐ Hydrogen Peroxide
- ☐ Sodium
- ☐ "Elvadex" Vinyl Polymer
- ☐ 1, 5-Pentenediol
- ☐ Dihydropyran

CP-11



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WE'VE A NEW WAY
BETTER THINGS FOR BETTER LIVING
... THROUGH CHEMISTRY

Name _____

Title _____

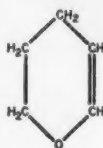
Firm _____

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City _____ State _____

When inquiring check CP 3396 on handy form, pgs. 2-3

New Products



Dihydropyran

Colorless liquid. B.P. 86°C. Flash point, -18°C. Solubility in water at 20°C., 3 g./100 g. Miscible with common organic solvents.

The reactivity of the double bond makes possible a wide variety of addition compounds. Hydrogenation yields tetrahydropyran, an excellent solvent and chemical intermediate. The following reactions suggest applications for dihydropyran as an intermediate:

With Mono- And Polyhydroxy Compounds.....Tetrahydropyryl Ethers
With Hydrogen Bromide

.....2-Bromotetrahydropyran
Chlorination

.....2, 3-Dichlorotetrahydropyran
Hydrolysis

.....Deltahydroxyvaleraldehyde
Write for Bulletin No. 18.

1, 5-Pentenediol

(Pentamethylene Glycol)

HO • CH₂ • CH₂ • CH₂ • CH₂ • CH₂ • OH

Colorless, odorless, viscous liquid. B.P. 239°C. at 760 mm., 148°C. at 30 mm. Specific gravity 0.994. Miscible with water, methanol, acetone, etc.

In chemical reactions 1,5-pentenediol exhibits characteristics similar to those of other glycols. Dehydration, oxidation, esterification and acetalization can be carried out to yield a variety of interesting derivatives.

Esters and polyesters of 1,5-pentenediol may be used as plasticizers, emulsifying agents and resin intermediates. Other possible applications include steam-set inks, paper coatings, leather treating and finishing compositions, perfumes, soaps and detergents.

Check coupon below for Bulletin No. 20.

Description: Stycast 2850 GT is a modified epoxide casting resin. Supplied as a viscous, portable resin, it cures to a black opaque product. Cured at 100°C for one hour, resin has the following typical properties:

| | |
|---|----------------------|
| Tensile strength (psi) | 8400 |
| Flexural strength (psi) | 13,300 |
| Flexural modulus (psi) | 2 x 10 ⁶ |
| Impact (Izod, ft lb/in of notch) | 0.24 |
| Shrinkage (%) | <1 |
| Heat distortion point (°F) | 347 |
| Water absorption (7 days) | <0.1 |
| Dielectric strength (v/m) | 455 |
| Dielectric constant (10 ² to 10 ¹⁰ cy. approx.) | 4.7 |
| Volume resistivity (ohm-cm @ 25°C) | 5 x 10 ¹⁸ |
| Dissipation factor (10 ² to 10 ¹⁰ cy. approx.) | 0.01 |

For this elevated temperature cure, 4% of Catalyst #11 is added, on the basis of resin weight. For room temperature cure, 2% of Catalyst #9 is used. Complete cure is obtained in about 24 hours at room temp, with hardening taking place in about four.

(Epoxide casting resin is a product of Emerson & Cuming, Inc., Dept. CP, 869 Washington St., Canton, Mass. . . or for more information check CP 3397 on handy form, pages 2 and 3.)

Triphosphopyridine nucleotide has exceptional purity

Triphosphopyridine nucleotide (TPN), also known as coenzyme II, has approximately 100% purity. Coenzyme has been purified by ion-exchange chromatography. TPN is a necessary co-factor in the metabolic oxidation of sugars and also in the citric acid cycle.

(TPN is a product of Pabst Laboratories, Div. of Pabst Brewing Co., Dept. CP, 1037 W. McKinley Avenue, Milwaukee 3, Wisconsin . . . or for more information about manufacturer's product reader may simply check CP 3398 on the convenient Reader Service slip which is located between pages two and three.)

Reviews general effect of lecithin on TiO₂ dispersion in latex paints

Monograph shows effect of lecithin on dispersion of rutile and of anatase titanium dioxide in latex paints, together with its effect on behavior of the pH and viscosity of the paint system. Seven graphs and 12 tables appear in the eight-page reprint.

"Effect of Lecithin on the Dispersion of Titanium Dioxide in Latex Paints" may be obtained by remitting 25c direct to Office of Information Services, New York University, University Heights, New York 53, N.Y.

MATERIALS

1 gram

of
DOW CORNING
ANTIFOAM A
kills foam in . . .

170 POUNDS
strawberry jam

4000 GALLONS
varnish resin

2332 POUNDS
neoprene latex

3 TONS asphalt

Effective at very low concentrations, Dow Corning Antifoam A Compound is the most economical, the most efficient and the most versatile foam-killer ever developed. Odorless and tasteless, this silicone defoamer is physiologically harmless in foods at concentrations up to 10 parts per million. Thousands of chemical and food processing plants depend on Dow Corning Antifoam A to cut processing time, to save productive capacity now wasted on foam, and to eliminate wasteful and hazardous overflow.

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is a dilutable defoamer containing 30% Antifoam A. It is easily dispersed, equally versatile and equally effective against aqueous foamers. It is safe to use in food processing at concentrations up to 10 parts Antifoam A per million parts of the foamer.

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COMPANY _____

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When inquiring check CP 3399 on handy form, pgs. 2-3



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617-29 Grant Building, Atlanta, Georgia

materials

Dimethyl silicone gum has high viscosity, is easy to handle with conventional compounding equipment

Availability of silicone gum and formulation data allows compounders to —

formulate silicone rubber for specific requirements

No preliminary breakdown needed with gum which can be mixed with components on conventional equipment

Uses: When combined with heat-stable fillers, additives, and a vulcanizing agent, gum yields a variety of silicone rubber compounds for a wide range of applications, such as electrical insulation.

Features: Material is a stable and uniform silicone rubber gum that allows fabricators and compounders to put their know-how to best advantage in formulating silicone rubbers which meet specific requirements.

From one gum, stocks which meet AMS or SAE-ASTM specs or military wire and cable insulation requirements can be compounded.

Description: Dow Corning 400 Gum is a clear, high molecular weight, high viscosity dimethyl silicone polymer. Williams plasticity is 45 mils and sp gr (@ 25°C) is 0.98. When properly compounded, products are heat-stable and serviceable over a -70 to 500°F temperature range. They are resistant to weathering, oxidation, and action of



chemicals, oils, and corrosive gases. Tensiles pull in the range of 600-700 psi after a cure of four hours at 400°F. Corresponding elongations are about 170-110%. Duro is close to 70, Shore A scale.

Requiring no breakdown, gum and components can be milled on conventional water-cooled, two-roll, differential speed mills.

Fillers should be neutral, heat-stable inorganics such as silica, diatomaceous earth, metallic oxides, or CaCO₃. In general, benzoyl peroxide dispersed in Dow Corning 200 Fluid (such as Luperco ASF and Cadet 35) or *tert*-butyl perbenzoate make the most satisfactory vulcanizing agents.

Ingredients are added in this order: gum, filler, additives, cure agent. After cure has been added, processing temperatures should be kept below 130°F. When stock is thoroughly blended, it should be strained in order to obtain best results. Cure temperature of rubbers containing benzoyl peroxide is 260°F; for rubber made up with the perbenzoate, 300°F.

Cleanliness is important. Mill must be free of organic contaminants, such as rubber, grease, or carbon black, which inhibit vulcanization and alter cured properties.

(Silicone gum is a product of Dow Corning Corp., Dept. CP, 592 Saginaw Rd., Midland, Mich. . . or check CP 3401 on handy form, pages 2 and 3.)

When inquiring check CP 3400 on handy form, pgs. 2-3

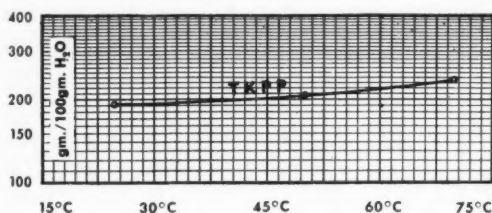
**Highly soluble in water,
agent sequesters twice
as much Mg^{++} as Ca^{++}**

**recommended for softening waters of
high magnesium content**

Uses: For building potassium soaps in order to prevent precipitation of less soluble soda soaps, and as a sequestering agent for clarifying liquid soaps and shampoos. In textile applications, sequestering properties of compound are of value in degumming silk, and increasing effectiveness of dyeing agents in hard water. It is also used in water treatment and as a catalyst activator in the manufacture of cold rubber. Material is an excellent peptizing agent for keeping certain pigments in suspension in latex-based paints.

Features: Compound has high solubility in water, and is very stable even in boiling water.

SOLUBILITY OF TKPP



It has the ability to sequester approximately twice as much magnesium as calcium. Thus it can be recommended for softening waters that have a high magnesium, as well as calcium content.

Description: Tetrapotassium Pyrophosphate (TKPP) is a white, deliquescent powder with a theoretical P_2O_5 content of 42.9%. Its solubility in water is shown by the graph. Other properties include:

| | |
|--------------------------------------|------|
| Assay (%) | |
| $K_4P_2O_7$ | 96.8 |
| K_2HPO_4 | 0.4 |
| K_2SO_4 | 0.1 |
| K_2CO_3 | 0.2 |
| Ignition loss | 1.0 |
| Sequestering values (gm/100 gm TKPP) | |
| Mg | 6.7 |
| Ca | 3.8 |
| Fe | 0.2 |
| pH of 1% solution | 10.2 |

(TKPP is a product of Westvaco Chemical Div., Food Machinery & Chemical Corp., Dept. CP, 161 E. 42nd St., New York 17, N. Y. . . . or for more information check CP 3402 on handy form, pages 2 and 3.)

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Ethylene Glycol Diethylene Glycol

...Two more fine raw materials developed for you by Nitrogen Division. Of exceptional purity, these and other Glycols are now in production at our ultra-modern Orange, Texas, petrochemical plant. Available in bulk from Orange, Texas, in 4-, 6-, 8-, and 10,000-gallon tank cars or barges; L.C.L. shipments available in drums and tank trucks from Edgewater, N. J., New York City, Boston, Chicago, Los Angeles and other key industrial points.

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- Our Technical Service Staff is available to assist you in the use of Glycols.
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- Free samples of Ethylene Oxide—Ethylene Glycol—Diethylene Glycol—Triethylene Glycol are also available. Just write to the Nitrogen Division for any or all of these services. No obligation, of course.

NITROGEN DIVISION

ALLIED CHEMICAL & DYE CORPORATION

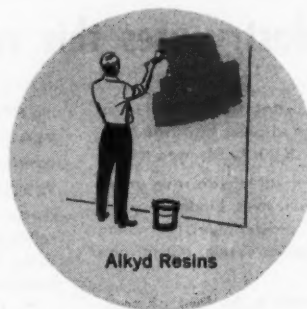
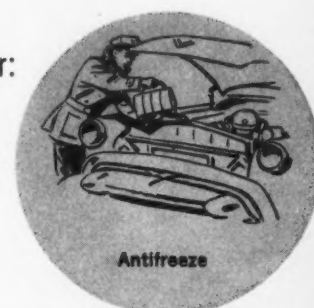
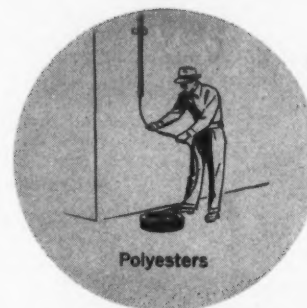
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Ammonia • Sodium Nitrate • Urea • Ethylene Oxide • Ethylene Glycol • Diethylene Glycol • Triethylene Glycol • Methanol • Formaldehyde • Nitrogen Tetroxide • U.F. Concentrate—85 • Nitrogen Solutions • Fertilizers & Feed Supplements



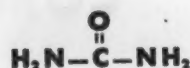
For:



For other resins, esters, solvents and plasticizers.

When inquiring check CP 3403 on handy form, pgs. 2-3

For prompt delivery ... specify



DU PONT Crystal Urea

(CARBAMIDE)

Dependably pure and uniform chemical
with these rigid specifications:

- pH (10% solution at 20°C.).....7.0 to 9.8
- Water.....0.50% Max.
- Ash.....35 p.p.m. Max.
- Iron.....2 p.p.m. Max.
- Free Ammonia.....20 p.p.m. Max.
- Color, A.P.H.A. (10g. in 100 ml. methanol)
.....10 Max.
- Turbidity, A.P.H.A. (50g. in 100 ml. water)
.....20 p.p.m. Max.

How industry uses this versatile chemical:

The purity and uniformity of Du Pont Crystal Urea make it ideal for use in a large number of products and processes. Listed below are some of the many fields in which it is being used today.

ADHESIVES: Manufacture of urea-formaldehyde resin adhesives, including plywood and paper adhesives, binder for composition board made of wood waste, cold-set glues, laminating resins, and core binders ... solubilizer in casein, animal and starch glues.

FINISHES: In enamels and other finishes in the form of modified urea-formaldehyde resins ... in fire-resistant paints.

PAPER: In urea-formaldehyde resins for imparting wet strength to paper and paper coatings ... softener for glassine paper and similar products ... ingredient in fire-resistant compositions

... solubilizer for starch in coatings.

PLASTICS: Manufacture of urea-formaldehyde resin molding compositions.

TEXTILES: In urea-formaldehyde resins to improve crush and crease resistance ... in acid and direct dyes for screen and roller printing of textiles ... with starch and other materials for sizing and finishing many types of textiles ... in flameproofing compositions.

Du Pont Crystal Urea also finds many uses in such fields as cosmetics, detergents and pharmaceuticals.

Du Pont Crystal Urea is packaged in 100-lb. multi-ply paper bags. Prompt shipment can be made from strategically located stock points.



Better Things for Better Living
... through Chemistry

Polychemicals
DEPARTMENT
CHEMICALS • PLASTICS

E. I. du Pont de Nemours & Co. (Inc.)
Polychemicals Dept. 5811 Wilmington 98, Del.

Please send me full information on Du Pont Crystal Urea—including specifications, chemical and physical properties, suggested uses, bibliography, etc. I am particularly interested in using Crystal Urea for the following applications: _____

Name _____ Position _____
Firm _____
Address _____
City _____ State _____

When inquiring check CP 3404 on handy form, pgs. 2-3

MATERIALS

Increases chemical resistance, gloss, adhesion when added to coatings; cuts viscosity of plastisols ...

resin is highly light-resistant, unsaponifiable, and substantially neutral

Uses: To improve characteristics of enamels and lacquers, and influence viscosity of vinyl plastisols.

Features: When added to urea-alkyd enamels, resin improves resistance to alkalis, soaps, and detergents. In nitrocellulose lacquers, adhesion is improved and gloss increased, as well as is hardness and alkali resistance. Viscosity of vinyl lacquers is lowered by addition of the resin, and adhesion to smooth surfaces is raised.

In vinyl plastisols, it replaces from 2.6 to 15% of vinyl resin, lowering initial viscosity and maintaining viscosity stability for long periods of time. When used in fabric retexturing, resin contributes to water- and crease-resistance and improves the hand.

Description: An alicyclic ketone resin, Resin MS2 is highly resistant to ultraviolet and visible

light, is unsaponifiable, and is substantially neutral. It has a high degree of resistance to acids, alkalis, and water, yet is soluble in a wide range of organic solvents. Material is compatible with PVC dispersion grade resins, and a wide range of coating resins, film-formers, and ester plasticizers.

Typical physical properties of the pale yellow brittle solid are:

| | |
|---|------------------|
| Acid number | Practically zero |
| Softening point (ball & ring, °C) | 85-95 |
| Sp gr (25°C) | 1.078 |
| Color (Rosin standards) | X |
| Color of 50% soln. in xylene (I.P.V.R.) | 3 |

(Alicyclic ketone resin is a product of Baird Chemical Corp., Dept. CP, 254 W. 31st St., New York 1, N.Y. ... or check CP 3405, pages 2 and 3.)

New designations for Corrosion-resistant Alloys. See page 200 for tabulation, recommendations

**From *p*-chlorothiophenol
come oil additives,
insecticides . . .**

intermediate is highly reactive

p-Chlorothiophenol has been used to make potential anti-malarials, and may be used to prepare mixed disulfides, which have been suggested as oil additives, insecticides, and fungicides. By analogy with chlorophenol, *p*-chlorothiophenol should be a good intermediate in synthesis

of insecticidal synergists, fungicides, and herbicides. On reaction with various phosphorus and sulfur chlorides and oxichlorides, compound forms products which have possibilities as insecticides, plasticizers, stabilizers, and oil additives. Assay of chemical, as supplied, is 99% (minimum) with 0.1% ash (maximum).

(*p*-Chlorothiophenol is a product of Evans Chemetics, Inc., Dept. CP, 250 E. 43rd St., New York 17, N.Y. . . . or for more information check CP 3406 on handy form, pages 2 and 3.)

**Isopropyl ether is offered
in reagent grade . . .**

water content is below 0.05%

Isopropyl ether is available as a certified reagent. Water is below 0.05%, and alcohol is under 0.1%. Ether is packaged in pint, quart, and gallon units.

(Isopropyl ether reagent is a product of Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. . . . or for more information reader may simply check CP 3407 on convenient Reader Service slip which is located between pages two and three.)

For more information on product at right, specify CP 3408 . . . see information request blank between pages 2 - 3.

FAMOUS LIGHTHOUSES OF AMERICA



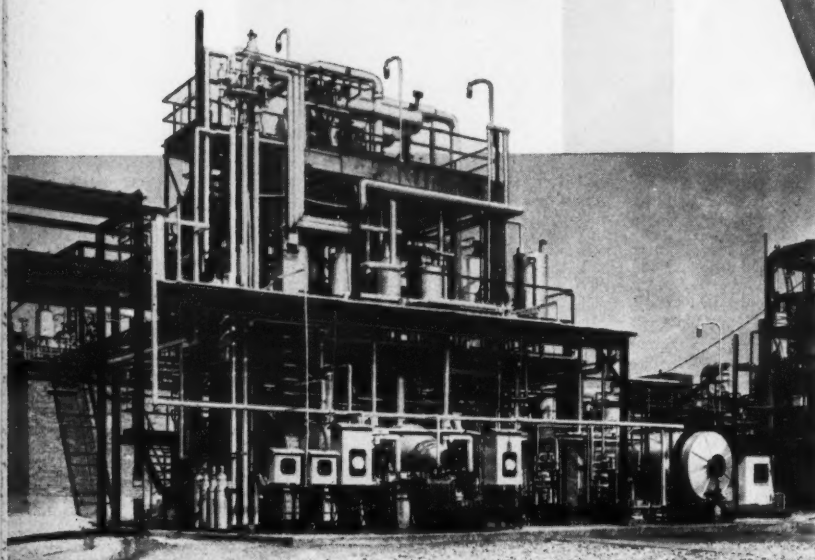
MINOT'S LEDGE LIGHT, one of America's most famous wave-swept lighthouses, guards ships against treacherous reefs 6½ miles southwest of the entrance to Boston Harbor. The first tower at Minot's Ledge, an openwork iron pile structure completed in 1850, was toppled into the sea by a great storm in 1851. The second tower, built of interlocking granite blocks and completed in 1860, still stands solidly on the ledge.

A familiar beacon and safe guide to quality in electrochemicals is the name Niagara Alkali Company, long recognized as a leader in this field of chemical production. Depend on Niagara for quality and good service in Nialk® Liquid Chlorine, Nialk Caustic Potash, Nialk Carbonate of Potash, Nialk Paradichlorobenzene, Nialk Caustic Soda, Nialk TRICHLORethylene, Niagathal® (Tetrachloro Phthalic Anhydride).

NIAGARA ALKALI COMPANY

60 East 42nd Street, New York 17, N. Y.

WE MAKE IT CLEAR...



at our new Aniline Plant in Moundsville, W. Va.

Our new aniline produced at Moundsville, West Virginia is water-white, extremely pure, uniform in analysis.

Made by a continuous catalytic hydrogenation process developed in National Aniline Laboratories, this aniline sets a new standard of quality. Automatic instrumentation assures absolute uniformity.

An ample supply of by-product hydrogen from an adjacent Allied Chemical plant assures dependable output.

Users of aniline benefit also by our plant location on the Ohio River (just below Wheeling) from which delivery can be made by rail, truck or inland waterway. We will be pleased to furnish samples, specifications and price quotations.



NATIONAL ANILINE DIVISION

ALLIED CHEMICAL & DYE CORPORATION 40 Rector Street, New York 6, N. Y.
BOSTON PROVIDENCE PHILADELPHIA CHICAGO SAN FRANCISCO PORTLAND, ORE GREENSBORO CHARLOTTE RICHMOND ATLANTA COLUMBUS, GA NEW ORLEANS CHATTANOOGA TORONTO



MATERIALS

Roller or screen printing on cottons and viscose with brown dye

Uses: For roller or screen printing on cottons and viscose alongside azoics, pigments, or other soluble vats where acid aging is used.

Features: Brown dye has excellent leveling properties for dyeing cotton, rayon, and linen dress goods and shirtings. On tightly woven cotton fabrics, slub weave rayons, and mercerized broadcloths, dye shows a solid surface appearance.

Description: Calco Soluble Vat Brown BY is latest addition to manufacturer's line of leuco ester colors. Dye is also effective on wool where light and wet fastness properties are required.

(Brown dye is a development of Dyestuff Dept., American Cyanamid Co., Dept. CP, Bound Brook, N. J. Check CP 3409, pages 2 and 3.)

Lowers firing temperature of ceramic materials, allows fast firing

Uses: In ceramic materials such as wall tile, floor tile, dinnerware, and artware.

Features: Flux lowers firing temperature of most ceramic bodies, when used in small amounts. In larger amounts, it permits small ceramic products to be fired rapidly and continuously in conveyor belt furnaces or decorating kilns.

Description: Vitromix is a finely-ground body flux. Tiles containing the material have been produced commercially at 1350 to 1400°F in 60 to 150 minutes.

(Flux for ceramics is a product of Vitro Corporation of America, Dept. CP, 60 Greenway Dr., Pittsburgh 4, Pa. Check CP 3410, pages 2 and 3.)

For more information on product at left, specify CP 3411
... see information request blank between pages 2-3.

MATERIALS

Light-colored sodium lauryl sulfate yields uniform paste or liquid shampoo formulations . . .

viscosity difficulties and stability variations are practically eliminated

Uses: In cream shampoos, either liquid or paste, and as an emulsifying agent for such products as dishwashing compositions, car washes, personal cleansing components, and in emulsion polymerization.

Features: Compound, lightest colored sodium lauryl sulfate available, yields uniform results when formulated into shampoos. Viscosity difficulties are practically eliminated as are variations in shampoo stability. Compound is indefinitely stable under neutral or alkaline conditions.

Description: Pedit WA Cosmetic is a slightly viscous, clear, liquid sodium lauryl sulfate, having the following uniform specifications:

| | |
|----------------------------|-----------|
| Sodium alcohol sulfate (%) | 28-30 |
| Free fatty alcohol (%) | 1.0-2.5 |
| Sodium chloride (% max) | 1 |
| Sodium sulfate (% max) | 1.5 |
| pH (10% solution) | 7.0-8.5 |
| Sp gr | 1.04-1.06 |

Suggested formula for liquid cream shampoos:

| | High active | Low active |
|--|-----------------------|------------|
| Pedit WA Cosmetic | 40% | 20% |
| Coconut fatty acid amide | 3.5 | 3.5 |
| Ethylene glycol monostearate | 3 | 3 |
| Inorganic salts (NaCl, Na ₂ SO ₄ , etc.) | 0.5 | 0.5 |
| Color and perfume | (sufficient quantity) | |
| Water to make 100% | | |

Heat Cosmetic to 150-160°F. Add with agitation coconut fatty acid amide and ethylene glycol monostearate. Mix until thoroughly dispersed. Add water and inorganic salts. (Salt content can be adjusted to provide desired viscosity, but at least 0.3% should be used to insure stability.) After mixing is complete, cool to 120°F, add color and perfume. Fill at room temperature.

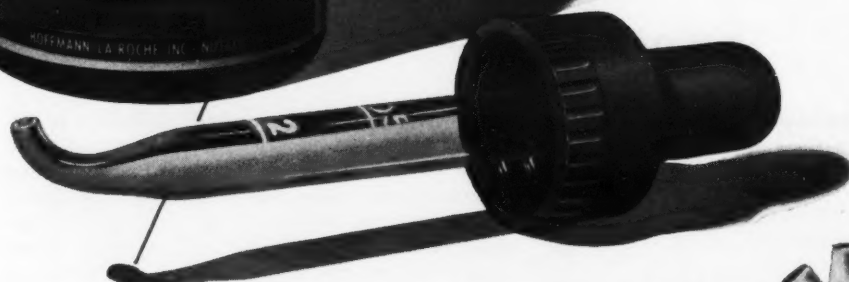
(Sodium lauryl sulfate is a product of Raymond Laboratories, Inc., Dept. CP, 261 E. Fifth, St. Paul 1, Minn. Check CP 3412, pages 2 and 3.)

Issue technical bulletin on morpholine

Used for making rubber accelerators, dyestuffs, pharmaceuticals, emulsifying agents, oil solubilizers, and corrosion inhibitors — morpholine is a versatile industrial chemical.

Bul F-8488 is issued by Carbide & Carbon Chemicals Co., a Div. of Union Carbide & Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N.Y. Specify CP 3413, pages 2 and 3.

since 1931



Glycerine is the Stabilizer

Because of its many advantages in the treatment of certain cardiac disorders, Digalen 'Roche' has been a valuable asset to clinicians throughout the world since its introduction in 1931. Rigid control measures are used in the manufacture of Digalen to assure unvarying composition. Its 33% Glycerine content provides stabilizing action, and in a product of this type stability is absolutely essential.

The nature of the ingredients in many pharmaceutical preparations is such that they require a stabilizer to maintain their effectiveness. Glycerine is frequently chosen to do this job, not only because it is an excellent stabilizer, but also because it can provide many other properties, too. Glycerine can act as a demulcent, solvent, suspending agent, humectant, or preservative.

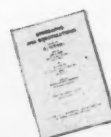
Glycerine is nontoxic, and has a pleasant taste. No other product comes even close to matching Glycerine's unusual combination of properties.

TECHNICAL DATA

which you should have



20-page booklet on Glycerine for product conditioning



12-page booklet on Glycerine standards and specifications



16-page booklet on Glycerine properties and applications

For your free copy of any or all of these booklets, write Glycerine Producers' Association, 295 Madison Avenue, New York 17, N. Y.

Nothing takes the place of Glycerine



When inquiring check CP 3414 on handy form, pgs. 2-3

looking into the future

is everyday business at centrifuge research center

Preliminary, large-scale, and production tests predict centrifuge or filter performance at Massachusetts lab

How they do it—

Starting with an inquiry about how a particular product can be best filtered or centrifuged and what performance should be expected, basic requirements — rate, temperature, wash, fractionation point material is to be classified — are established. A preliminary sample is secured, usually a gallon, and the lab is ready to go to work.

Physical properties are checked, then slurry is subjected to various centrifugal, vacuum, and pressure tests to establish its centrifuging-filtering characteristics. Estimates of capacity, cake moisture, recovery, washability are formulated. Thus the laboratory can submit a preliminary report predicting relative performance on continuous or batch centrifugals, vacuum or pressure filters. Should this preliminary check show the slurry to be an application for one or more equipment types, large scale tests are recommended.

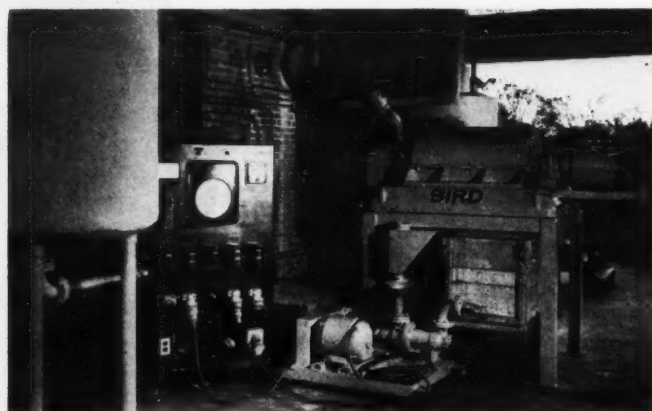
At this stage a careful review of preliminary test results in the light of process requirements will point

up the equipment best able to do the job. Material is then secured for production equipment tests. This may vary from fifty to five hundred gallons, depending upon problem at hand.

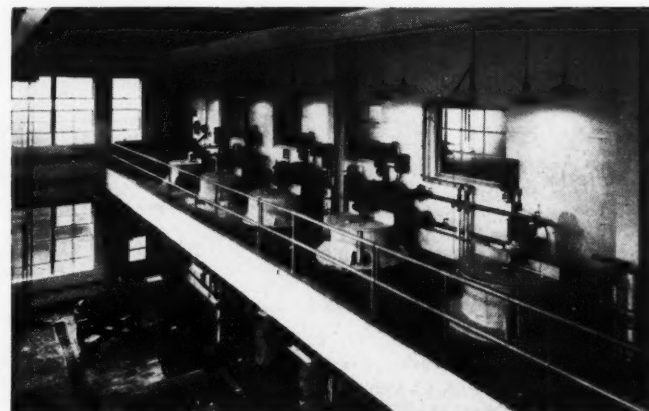
Large scale tests are usually witnessed, resulting in very close cooperation between customer and the laboratory personnel. Samples of feed, cake, and effluent representing expected performance are analyzed in the analytical section of the laboratory while tests are in progress. All of this makes it possible to observe how a material handles on various types of equipment and customers actually witness equipment performance first hand without going into production.



Catch-box being rolled under continuous centrifugal where it will catch cake



Continuous centrifugal filter being set up for test



Second deck for lab allows access to slurry tanks

How It worked out—

A typical case history goes something like this. A leading resin producer became interested at the Chemical Exposition in Philadelphia. Processor supplied information regarding his problem: dewatering and washing of a new resin.

A gallon sample was obtained and the lab started to work, with complete knowledge of temperatures, production rate, wash requirements, and cake moisture desired. Preliminary testing indicated that this material had excellent settling characteristics and that it should be a good application for a continuous solid bowl centrifuge. Further, small scale centrifuge tests indicated that the continuous centrifuge would discharge a cake containing about 25 to 28% moisture by weight. Preliminary washing tests indicated that material would lend itself to effective wash in continuous centrifugal equipment. Preliminary filtration tests were conducted and in this particular case indications were that vacuum filter cake could be expected to be about 10% higher in moisture than a continuous centrifuge cake.

Results of the preliminary tests were reported to the resin producer who in turn shipped 300 gallons of slurry for large scale test. This time one of his design engineers was present to observe the material being handled in production equipment. Centrifuge tests indicated that 99.9% of the solids could be recovered and that the predicted cake moisture content of 25 to 28% by weight satisfactorily bracketed the 26.4 to 27.2% actually obtained. Various wash ratios were employed and the samples analyzed in the laboratory for resulting purity. Satisfactory purity was obtained using approximately one half pound of wash per pound of dry solids.

Report, together with the samples from cake, feed, and effluent was sent to the resin maker for check analysis. The report with a quotation furnished technical information, recommendations, and cost data for an installation to meet requirements.

Continuous centrifugal filter was installed. A field engineer was on hand for the initial start-up. A return visit several weeks later indicated that the equipment had met performance requirements and added another name to the long list of applications which were first checked in the Bird Research and Development Center.

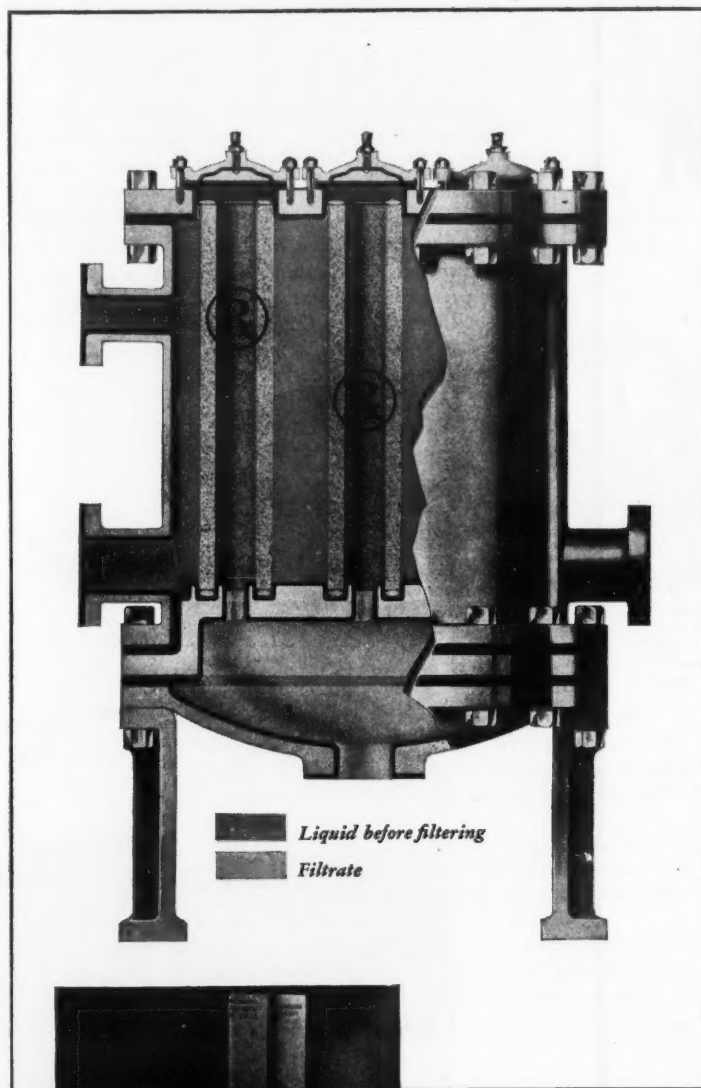
(This laboratory, the Bird Research and Development Center, is maintained by Bird Machine Company, Dept. CP, South Walpole, Mass. . . . or for more information check CP 3415, pages 2 and 3.)

Your guide to ideas . . .

is the handy Product Directory beginning on page 213 of this issue.

Another R on the job!

Outstanding performance of Adams filters aided by Norton seamless porous tubes



R. P. Adams Co. Filters, covering many chemical filtering services, deliver sparkling clear filtrate and insure quick cleaning without disassembly. Adams filters handling acid or neutral solutions are equipped with Norton seamless porous tubes, engineered and prescribed for faster, more thorough filtering and backwashing.

Besides assuring fast, thorough filtering action, Norton porous tubes are extremely easy to clean by backwashing. Here are several good reasons why they excel in these two primary essentials of efficient, economical filter performance:

- Norton porous tubes are made of ALUNDUM® (fused alumina) engineered by Norton for chemical stability, inertness and other properties necessary to withstand acid, neutral and slightly alkaline liquors.
- Like all Norton ALUNDUM porous mediums they are made with the patented controlled structure process that assures even distribution of pores — for uniform passage of both filtering and backwashing liquids.
- They are seamless, providing unobstructed diffusion over their entire area — for further efficiency in both filtering and cleaning.

Other big advantages

of all Norton porous mediums include ease of installation and exceptional resistance to breakage and chipping. Available in sizes and open-pore ratios to meet your needs, they're engineered to last longer and cut your operating costs — and they're prescribed for a wide variety of chemical services, such as filtering water or solvents . . . cutting oils, wine, etc. . . . reclaiming cleaning fluids and industrial waste . . . and for boiler feed water treatment.

See your Norton Representative for further facts or write, describing your requirements, to NORTON COMPANY, 570 New Bond St., Worcester 6, Mass. Canadian Representative: A. P. Green Fire Brick Co., Ltd., Toronto, Ontario.



REFRACTORIES

Engineered... R... Prescribed

Making better products...
to make other products better

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

When inquiring check CP 3416 on handy form, pgs. 2-3



LITHIUM

... The Miracle Element

Lithium has made the world its market. To supply that market, Lithium Corporation has assured itself a supply of spodumene ore, the most plentiful and economic lithium raw material, sufficient for years to come. To meet industry's demands for more Lithium products, we are doubling our metal-making capacity and greatly increasing overall production. A new research and development laboratory will continue to develop new and improved uses for Lithium chemicals for the benefit of all industry.

Lithium has found a permanent place in the organic chemical, ceramic, metallurgical, pharmaceutical, grease and atomic energy fields. Lithium is a valuable additive in glassware and pottery, vitamins, welding flux, optical lenses and prisms, cosmetic cream, storage batteries, varnish, candles, bleaches, signal flares and television tubes. Many of its uses were unheard of a year or two ago.

Investigate Lithium's unusual, sometimes paradoxical, often uniquely valuable properties. Research quantities and Data Sheets are available on some 25 different products — metals, salts and special compounds. Write for them.

... trends ahead in industrial applications for Lithium

**LC
A** LITHIUM CORPORATION
OF AMERICA, INC.
General Offices: Suite A,
Rand Tower, Minneapolis 2,
Minn.

Mines:

Black Hills, South Dakota, Bessemer City, North Carolina, Manitoba and Quebec.

Plants:

St. Louis Park, Minn. and Bessemer City, North Carolina

Ideas

Simplified column design assures . . .

efficient extraction at less cost

Rotating-disc column already proved on mercaptans, essential oils, and halogenated hydrocarbon extractions

Highly efficient, simple and economical to operate, and easy to maintain — these are features of Rotating Disc Contactor (RDC)*, a liquid-liquid countercurrent extraction column which overcomes the main disadvantages of conventional extraction equipment.

Relatively low priced, the unit is said to offer significant economic advantages both to new and existing extraction plants. Column was developed by Shell Development Company and its associates in the

*Patent 2,601,674; other patent applications pending

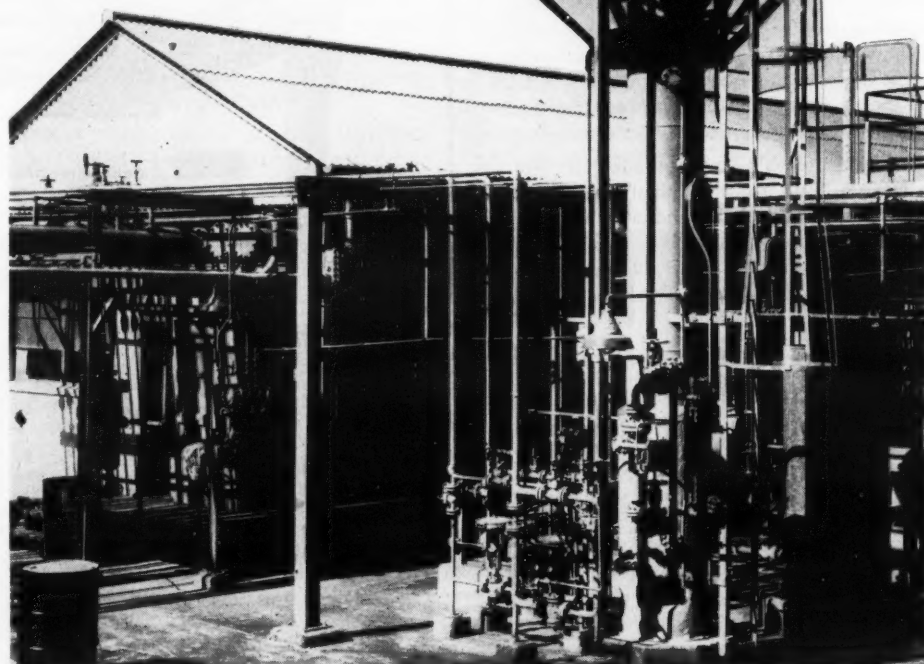
course of several years of research work and testing.

Simply designed, contactor consists of a vertical cylinder containing stationary doughnut-like baffles and a rotating shaft fitted with circular horizontal discs (rotator discs) spaced between baffles. Shaft passes through gland in flanged top cover of contactor and is gear-driven by small electric motor. Shaft speed in many commercial applications is below 100 rpm.

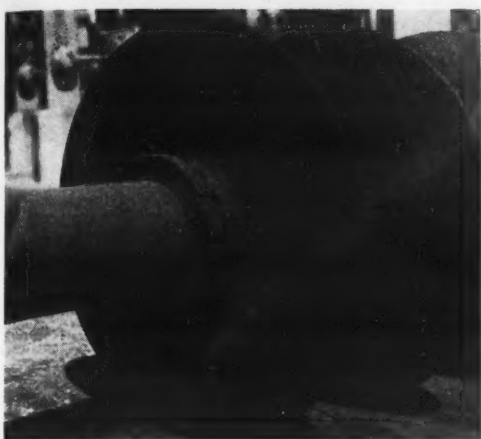
Column is divided into three sections. Top and bottom sections are small settling compartments in which the dispersed phase separates and the interface level is maintained. Interface can be held in either compartment, depending upon whether light phase or heavy phase is dispersed.

Middle section is countercurrent extractor proper.

RDC column, 20' high x 2' diam, separates halogenated hydrocarbons by countercurrent extraction at Shell Chemical Corporation's plant in Houston, Texas



When inquiring check CP 3417 on handy form, pgs. 2-3

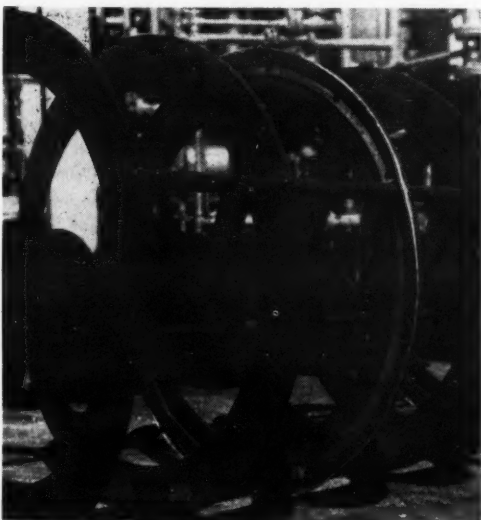


Close-up of shaft and rotary discs of RDC column

Series of horizontal rings (stator rings) divide section into compartments. Shaft is located so that each rotor disc is midway between adjacent stator rings. Outer diameter of rotor discs is smaller than inner diameter of stator rings, so that rotors can be inserted or withdrawn.

In typical application lighter liquid enters at bottom of column and flows upward, countercurrent to descending heavier liquid entering at top. One of the liquids disperses into droplets which circulate in and pass through compartments defined by stator rings. Rate of counterflow of phases is function of difference in their densities, size of drops, and opposing velocity of continuous phase. Rotor discs control drop size and circulation rate within a compartment. Disperse phase holdup and surface area for mass transfer are varied by adjusting rotor speed. This provides

(Continued on next page)



Stator rings divide column into compartments

There is a difference in V-Belts— and it's Big Enough to Save You Money!

TEXROPE
V-belt
DRIVES

The secret lies in the way a belt is built. *Texrope* V-belts, with grommet construction, are completely different from seven leading competitive brands. Tests revealed some astonishing facts.

For instance, a *Texrope* grommet belt, C section, had almost 50% greater strength than the best of the other comparable belts . . . almost twice as much strength as the poorest.

Ask your A-C representative or distributor for the complete story. Have him show you what the difference in V-belts means in terms of dollars you can save.

A-4456

Texrope is an
Allis-Chalmers trademark.



ALLIS-CHALMERS

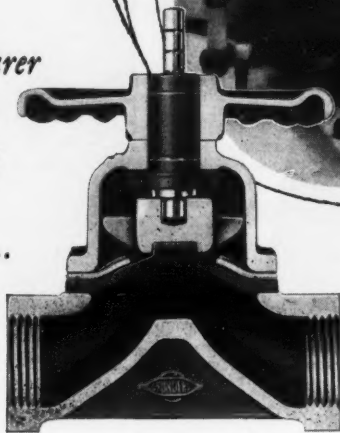
Milwaukee 1, Wisconsin

When inquiring check CP 3418 on handy form, pgs. 2-3



Screening Loss Cut 50%

*TV tube
manufacturer
reports
big saving
after
installing...*



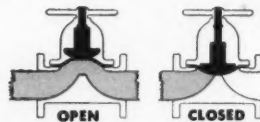
Grinnell-Saunders Diaphragm Valves

Radio Valve of Toronto faces this problem. In making its TV tubes, large quantities of the purest water possible are needed. Obligated to use regular city water, Radio Valve's first job is to filter this water to make it sterile and free of minerals. Next, 2 or 3 gallons are introduced into each TV tube. A fluorescent powder is added, which is allowed to settle on the screen. After decanting the water, screens are checked for flaws. Obviously, impurities in the water mean flaws in the screen, and a loss of time and money.

Since the installation of Grinnell-Saunders Diaphragm Valves, this user reports screening losses cut in half! Con-

tamination of the purified water is eliminated, because the water passing through the valve is completely isolated from the valve mechanism. Of the Grinnell valves in this service, approximately 90% are stainless steel.

With the Grinnell-Saunders valve, the flexible diaphragm lifts high for streamline flow, in either direction; closure is positive against pressure or vacuum. There are no packing glands to demand attention, no metal-to-metal seats to become damaged or wire-drawn, no refacing or reseating. Body, lining and diaphragm materials are available to meet different service conditions. Write for full details.



GRINNELL
WHENEVER PIPING IS INVOLVED



Grinnell Company, Inc., Providence, Rhode Island

Coast-to-Coast Network of Branch Warehouses and Distributors

pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves
Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies
industrial supplies • Grinnell automatic sprinkler fire protection systems • Amco air conditioning systems

When inquiring check CP 3419 on handy form, pgs. 2-3

IDEAS

(Continued from preceding page)

simple and effective method of obtaining optimum extraction conditions for any given system.

Flooding will occur at excessive rotor speeds because droplets are too small and dispersed phase cannot rise as fast as it is fed into column. Extraction efficiency is greatest at a rotor speed just before flooding occurs. Volumetric efficiency of unit (flow rate divided by volume of a theoretical stage, employing total cross-section of column) is reported to be greater than any other commercially available gravity flow contactors for which test data have been published.

Rotor speeds necessary for maximum efficiency vary with specific gravity difference, interfacial tension, tendency of phases to emulsify, viscosity, and temperature of given system. At present, in designing RDC's, it is not known how to predict performance from physical properties alone. Plot runs must be made to evaluate effect of rotor speed and throughput on column efficiency. Extractors have been built in sizes ranging from 2" to 7'3" diameter.

Systems on which RDC units are already in service include furfural-lube oil, extractive separation of halogenated hydrocarbons, sodium-hydroxide extraction of mercaptans from gasoline fractions, unsulfated organic materials from ester-salts solution with gasoline, and concentration of valuable essential oil components.

(RDC's for chemical field applications are available under Shell license from Turbo-Mixer, a division of General American Transportation Corporation, 380 Madison Avenue, New York 17, New York . . . or for more information check CP 3420 on handy form, pages 2 and 3.)

Ideas for corrosion control — December CP . . .

Recent, pertinent technical papers on corrosion prevention—by specialists in the field—will be condensed in the expanded Corrosion Control section in the December issue of **CHEMICAL PROCESSING**. This feature section will give you ideas for battling corrosion in your own plant.

The corrosion feature will include a guest editorial by Dr. Aaron Wachter, of Shell Development, an outstanding authority on corrosion problems. Ideas may also be obtained from the most-recent developments in corrosion control that will appear, as well as from articles covering actual case histories in chemical plants.

For these and other ideas for combating corrosion—see December CP.

Coal, fly ash removed from boilers quickly and economically by vacuum system . . .

hinged caps in 5" diam line make hose connections possible virtually anywhere in boiler room

Central vacuum cleaning system installed in boiler room at Clifton Paperboard Company, Clifton, N.J., cuts hours from job of recovering unused coal from boilers. Same system is also used for removing fly ash from boilers and for general clean-up work around the room.

Here is how the system works. Vacuum is created by a 790-cfm blower, and is carried in a 5" diam pipe to various locations in the boiler room. Hinged caps in the pipe enable workers to connect flexible hose-



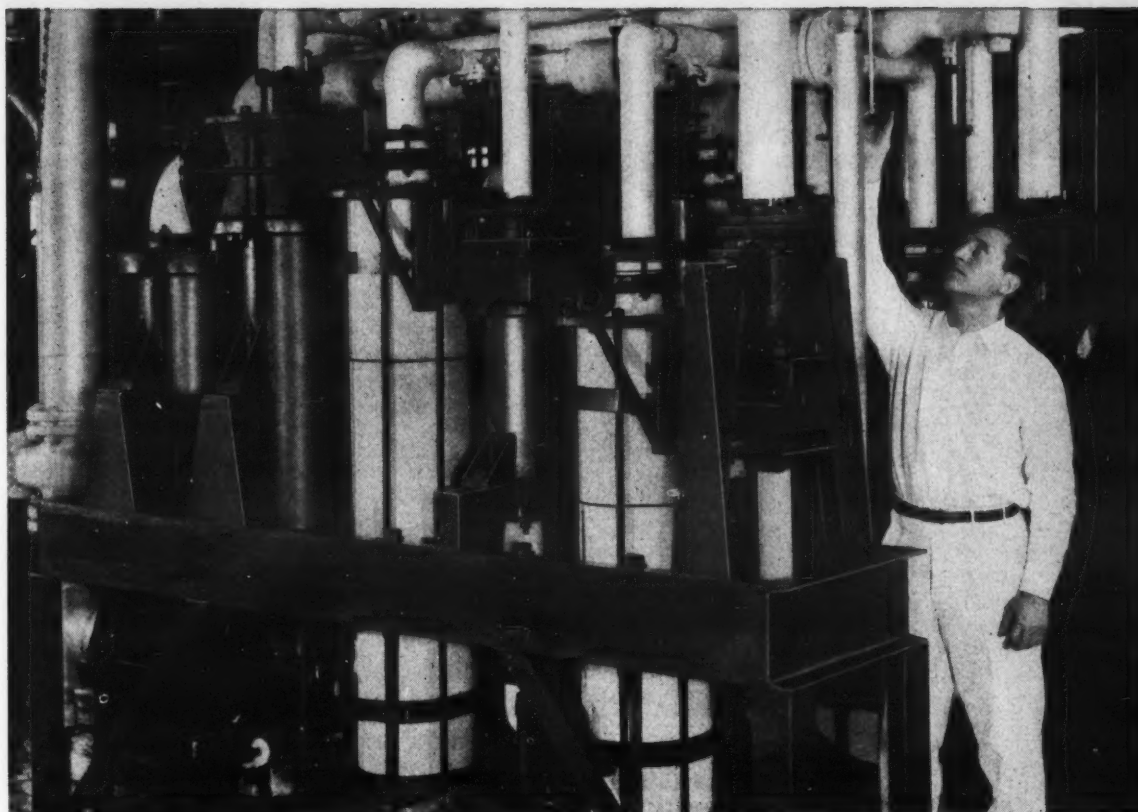
Removing unused coal from boilers is simple task with central vacuum system. Typical hose connection to vacuum manifold is at right foreground

and-nozzle assembly into vacuum system virtually anywhere in the room. A pair of hoppers installed on vacuum side of exhauster, act as separators for material being collected. Primary hopper catches larger particles; secondary hopper traps fine particles. To clean out a wind box, flexible hose assembly is connected to nearest vacuum outlet and the nozzle is inserted into the box. Coal is picked up, carried through system, and collects in primary separator (about 3-ton capacity).

Recovered coal is dropped through hatchway at bottom of separator into a lorry which takes the coal back to furnaces' hopper for reuse. Fine particles and dust are reclaimed by vacuum-driven fly-ash reclaimer connected to top of secondary separator. Reclaimed fines are blown directly into fire bed for their fuel value.

Time and manpower savings resulting from use of system are reported to pay for it within two years.

(Central vacuum system is development of the Lamson Corp., Dept. CP, 303 Lamson St., Syracuse 1, N. Y. . . . Check CP 3421, pages 2 and 3.)



FOUR-STAGE WORTHINGTON STEAM JET EJECTORS of impervious graphite, with two porcelain barometric intercondensers at Pfizer plant. Ejectors are used to maintain vacuum in vitamin A synthesis.

Worthington steam jet ejectors maintain vacuum under corrosive vapor attack at Pfizer

Exhibit A in the case for Worthington steam jet ejectors is this installation at Chas. Pfizer & Co. plant in Groton, Conn.

Two years ago these Worthington units replaced rotary vacuum pumps assigned to maintaining a steady vacuum for a distillation process in the manufacture of synthetic vitamin A. This constant vacuum of 1 mm (equal to 0.04 inches of mercury) must be held for two days, the period of processing. When corrosive vapors showed up unexpectedly in the process, the rotary vacuum pumps just couldn't take it. These vapors have no effect, however, on the Worthington ejectors which

are designed specifically to function reliably under the toughest kind of corrosive conditions.

Maybe your product is corrosive; maybe it isn't. But if you need a vacuum from atmosphere to 50 microns absolute, take a long look at Worthington's comprehensive line of steam jet ejectors which use regular plant steam. They're low in first cost, and their operating and maintenance expenses are practically non-existent — no moving parts. You can specify them in stainless, bronze, porcelain, impervious graphite, Worthite, cast iron or steel. Write Worthington Corporation, Steam Power Division, Ejector Section X.3.2, Harrison, New Jersey.

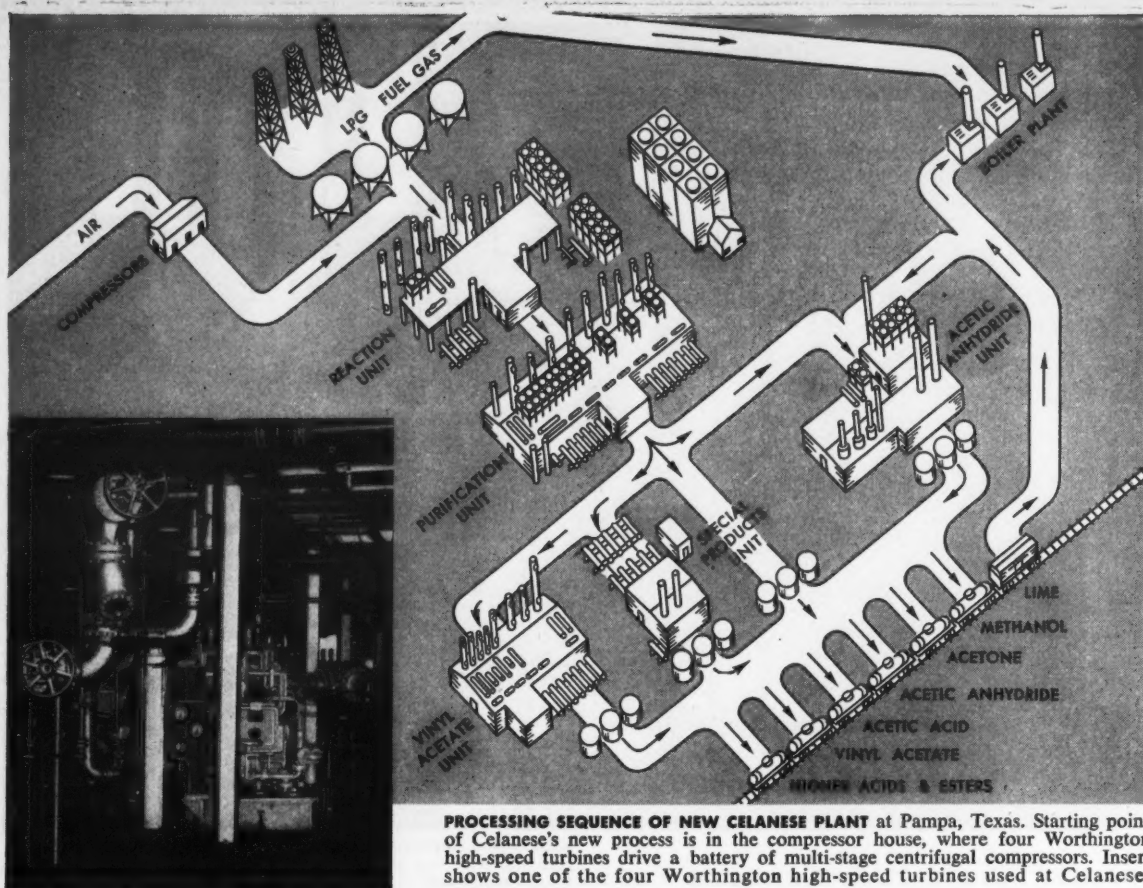
X.3.2

WORTHINGTON



• Steam Jet Ejectors • Gas Compressors • Chemical Pumps • Industrial Mixers • Refrigeration Equipment

When inquiring check CP 3422 on handy form, pgs. 2-3



PROCESSING SEQUENCE OF NEW CELANESE PLANT at Pampa, Texas. Starting point of Celanese's new process is in the compressor house, where four Worthington high-speed turbines drive a battery of multi-stage centrifugal compressors. Insert shows one of the four Worthington high-speed turbines used at Celanese.

Four high-speed Worthington turbines drive compressors in new Celanese plant

In May, 1953, Celanese Corporation of America opened their new petro-chemical plant near Pampa, Texas, in the heart of the Panhandle.

By employing a new air-oxidation process, the Pampa plant will produce 1,800,000 lbs. of glacial acetic acid weekly, with 95% normal butane used as a charging stock.

Celanese selected four high-speed Worthington steam turbines to drive the centrifugal compressors used to compress air at the start of the oxidation process. The speeds of the turbines were determined by the nature of the process itself: two of the units are rated 3070 hp at 10,000 rpm, and two are rated 5000 hp at 7500 rpm. The control problem created by this arrangement was solved by using

Worthington Woodward governors with built-in air motors. The four turbine-compressor units are synchronized automatically by instrumentation in the control room.

There's a good reason why Celanese — and so many other leading industrial names — choose Worthington high-speed turbines for compressor and blower drives. They know that Worthington's long experience in compressor-drive engineering assures them of getting exactly the right type and size drive for their needs.

Find out how Worthington can help with your drive problems. Contact your nearest Worthington district office or write for Bulletin 1966 to Worthington Corporation, Steam Turbine Division, Wellsville, N.Y. T.3.7

WORTHINGTON



STEAM TURBINES

Single and Multi-Stage Turbines • Turbine-Generators • Deaerators • Boiler Feed Pumps • Surface Condensers

A GREAT TEAM IN STEAM

When inquiring check CP 3423 on handy form, pgs. 2-3

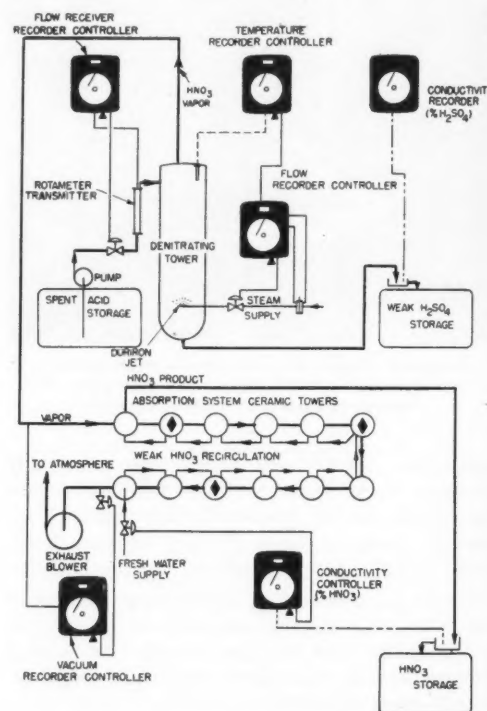
IDEAS

Automatic control found practical in recovery of spent acid from nitration . . .

steam stripping separates nitric and sulfuric, turns out usable 60% nitric

It has not been common practice to employ extensive instrumentation in systems for recovery of spent mixed acid. System outlined here, however, is being installed in a growing number of plants. It is automatic and provides accurate process supervision and control. Operating conditions are held stable — a feat practically impossible with manual control. Product is a uniform grade of 60% nitric acid.

Mixed sulfuric and nitric enter a ceramic-packed Duriron tower at concentrations from 70 to 80%. Steam, throttled in the range 120-150 psi, separates them. Dilute sulfuric bottoms are collected; nitric



Steam flow rate and tower temperature are cascaded for accurate and safe control of acid stripping tower

vapors are pulled through the overhead line to ceramic absorption towers. Tower top temperature resets steam input controller. Optimum range is 215 to 230°F. Acid input is controlled for a constant rate.

In addition to close temperature control, this cascade control compensates for variations in feed composition and steam pressure. It also prevents pressure surges which could blow out putty and sulfur seals on joints of the Duriron tower.

SEE the Worthington Corporation Exhibit in New York City. A lively, informative display of product development for industry, business and the home. Park Avenue and 41st Street.

IDEAS

To control vacuum at the exhaust blower (control range: $\frac{1}{4}$ to $\frac{1}{2}$ " of water) air is bled in through a butterfly valve. Valve is driven by vacuum controller measuring vacuum in the line (as shown here) or tower top. Two factors favor this method of control. First, because of the vacuum, any leaks in putty of sulfur joints are leaks *into* the system. No noxious fumes escape. Second, air bleed is an easy method of holding down vapor velocity in the line. High velocities overwork absorption towers, raise their temperatures, cut absorption efficiencies, and—in extreme cases—even lead to cracking of towers from overheating.

While precise hour-to-hour control is not practical by this method, 12 and 24 hour records show a constant 60% nitric acid product. These records are made by conductivity controller-recorder at input of nitric storage tank. This controller governs fresh water input to absorption train. If short-period product uniformity is important enough to warrant it, fresh water can be ratioed to mixed acid feed and reset (cascade) by the conductivity controller.

(Spent acid recovery system was engineered by The Foxboro Co., Dept. CP, 174 Neponset Ave., Foxboro, Mass. Check CP 3424, pages 2 and 3.)

Are you wondering why many of these editorial articles give . . .

Manufacturer's Name and Address . . . ?

You doubtless have noted names and addresses of manufacturers at the end of editorial articles in *CHEMICAL PROCESSING*. Have you wondered, "Is this some sort of advertising?"

It isn't . . . that "source" is there because the editors know that often you want more information, quickly and easily. Of course, such articles are purely editorial material which has been selected by the editors as being worthy of your attention . . . (it is **not** carried with any responsibility to the manufacturer nor does it obligate the manufacturer). This is strictly a service for you . . . the reader.

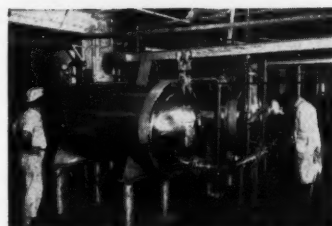
We know that many readers often want more than just the pertinent description and facts . . . so we tell you where and how you can obtain complete details, either by writing direct or using the handy Reader Service slip.

This is one of our extra Reader Services, pioneered in this field by *CHEMICAL PROCESSING* in 1938.

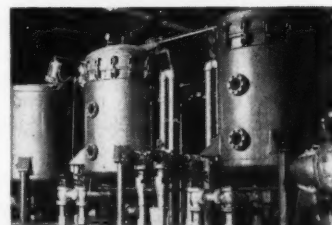
THE EDITORS



Now you can TRY BEFORE YOU BUY your Niagara Filter



Niagara Horizontal Filters provide rapid, easy dry cake removal . . . minimum downtime . . . complete filtrate clarity . . . and are available in sizes up to 1500 sq. ft. filtration area.



Niagara Vertical Filters provide highest liquid clarity. Compact, efficient, requiring minimum floor space. Sizes up to 960 sq. ft. filtration area.

Do you have a filtration problem? Are you planning the use of filters in a new process? Are there variables and unknowns which make it impractical to theoretically predetermine filter size, leaf area, flow rate, etc.?

The sensible . . . and economical . . . approach is to *try before you buy*. And Niagara makes this easy for you by means of a practical pilot filter rental service.

Niagara pilot filters are accurate, small capacity scale model units constructed almost exactly like full size Niagara Pressure Leaf Filters. They do a thorough, efficient filtration job and enable

you to observe and study results directly comparable to those you will get with production line Niagaras.

Niagara pilot filters, both vertical and horizontal type, are available for a nominal rental fee. A Niagara engineer will supervise the installation and will be glad to give you the benefit of his filtration experience if desired.

If you will fill out and mail the coupon below, we'll send you full details about the Niagara pilot filter rental service. Only a limited number of these pilot filters are available so we suggest prompt action.

Niagara Filters

DIVISION

AMERICAN MACHINE AND METALS, INC.

DEPT. CP1154, EAST MOLINE, ILLINOIS

In Europe: Niagara Filters Europe, Post Box 1109, Amsterdam-C, Holland

Please give us the details about your pilot filter rental service. Product to be filtered is _____

Name _____ Title _____

Company _____

Address _____

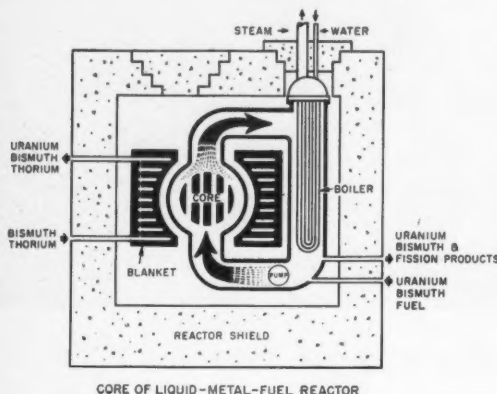
City _____ Zone _____ State _____

When inquiring check CP 3425 on handy form, pgs. 2-3

**Nuclear reactor "breeds" own fuel
and delivers by-products
to waste tanks . . .**

believe full-scale system could produce electricity from fission heat at very low cost

Preliminary design has been completed on nuclear reactor system which can generate electric power, "breed" new fuel for itself, and deliver by-products to waste tanks, all in continuous processes. Using liquid metal alloy (uranium-bismuth) as fuel



stream to inter-connect continuous processes, it is believed that a full-scale system could provide electrical energy from fission heat at lowest possible cost.

Fission of U_{233} atoms would occur in the LMFR (liquid metal fuel reactor) core, a perforated graphite sphere five feet in diameter. Heat from fission would be conveyed by molten uranium-bismuth alloy out of core and transferred to liquid sodium outside reactor. Sodium would deliver heat to water, producing steam to spin turbine driving generator.

Gaseous fission products would be removed from core by piping off part of molten uranium-bismuth and then sweeping products out of the liquid metal with an inert gas. Liquid salts such as potassium or lithium chloride could also be mixed with the bismuth carrier. Salts would draw off fission products while leaving uranium in the bismuth. While gaseous and liquid fission products are piped into storage tanks, uranium-bearing bismuth would be pumped back through core to continue production of heat.

Surrounding the core would be a graphite structure, or "blanket", through which would flow mixture of thorium and bismuth. Excess neutrons from fissioning atoms would be captured by thorium and form more U_{233} — thereby replacing fuel being destroyed.

New U_{233} would be continuously removed by extraction with molten salt, sent to storage tank, and

Service dictionary for ALCOA AL

Because of its long service life and low initial cost, ALCOA Aluminum has become one of the most popular metals in the chemical industries. Perhaps this service dictionary will help show why . . . and suggest some uses that can mean less down time, improved operations and greater savings in *your* business.

Acetic and other Aliphatic Acids

ALCOA Aluminum used in equipment producing glacial acetic acid has a service record as long as 17 years. Propionic and butyric acids as well as several of the higher molecular weight acids (fatty acids) also are processed, stored, and shipped in aluminum equipment.

Air and Gas Coolers

Aluminum heat exchanger tubes have been used successfully in air compressor intercoolers and aftercoolers. In one specific intercooler installation, aluminum tubes are still in service after more than 16 years with no significant corrosion being apparent. Alcoa Aluminum tubes are considered ideal for intercoolers handling natural gas, hydrogen sulfide, carbon dioxide, and many other gases.

Ammonia

ALCOA Aluminum heat exchanger tubes have given up to 15 years continuous service handling mixtures of ammonia gas, carbon dioxide, and water vapor in soda ash plants. More than 12 years of service have been experienced in the use of aluminum tubes in ammonia dephlegmators and condensers. Aluminum storage tanks, piping, and bubble cap towers for ammonia recovery are now in service.

Ammonium Nitrate

Ammonium nitrate and its aqueous solutions are handled extensively in aluminum. Aluminum evaporators, crystallizers, condensers,

screens, piping, pumps, tankage, and prilling towers are in use. Aluminum pressure vessels, piping, and tank cars are also used to handle ammonium nitrate fertilizer solutions.

Food and Drug Processing

ALCOA Aluminum has been used in these processes for over 30 years. Nontoxic to living organisms, aluminum successfully handles Chloromycetin, citric acid, gluconic acid, oxogluconic acid, calcium gluconate, dextro-lactic acid, Penicillin, Streptomycin, sorbose, and riboflavin.

Formaldehyde

Several ALCOA Aluminum condenser installations with excellent service records (some as long as 12 years) are in operation handling formaldehyde. Aluminum distillation towers, storage tanks, piping, heat exchangers, shipping drums, and tank cars also are in this service.

Hydrocyanic Acid

Aluminum process equipment for handling hydrocyanic acid includes distillation towers, absorption towers, heat exchangers, condensers, tankage, piping, and shipping drums.

Naval Stores

Naval stores—turpentine, rosin, copal, pentene, dipentene, and pinene—are widely handled in aluminum equipment. Aluminum resin kettles, evaporators, condensers, storage tanks,

ALUMINUM in the chemical industries

transfer lines, distillation equipment, piping, and shipping drums have been in service for over 20 years.

Oxygen

Aluminum is one of the most economical materials of construction for tonnage oxygen plants. Its mechanical properties increase substantially with decreasing temperature with no loss in ductility. Among its applications in this field are low pressure fractionating towers, trays and bubble caps, reboilers, acetylene separators, piping, conventional heat exchangers, and unique gas-to-gas reversing exchangers with very high transfer characteristics.

Petroleum Products

Aluminum storage tank roofs for sour crude oils have been in service for more than 20 years in locations where steel roofs failed in less than 5 years. ALCOA Aluminum heat exchanger tubes have been used for more than 18 years handling sour gasoline stocks. Aluminum bubble cap towers have given service of 10-15 years in debutanizer columns handling gasoline distillate from West Texas sour crudes at 200-425°F. Aluminum's low cost coupled with its remarkable resistance to corrosion by sulfur compounds has established its use in this industry.

Refrigeration

In addition to the inorganic refrigerants,

Helpful ALCOA Booklets

Call your nearest Alcoa sales office or write for any of these free booklets:

ammonia and sulfur dioxide, several halogenated organic compounds are used in aluminum refrigeration equipment. Of these, the Freons have proved very satisfactory for use in aluminum.

Soaps & Cosmetics

For nearly 25 years ALCOA Aluminum has been in continuous service handling fatty acids in storage tanks, condensers, piping, and tank cars. Aluminum protects the stability and color of essential oils, edible oils and fats and glycerine . . . effecting trouble-free service and yielding a higher quality product.

Solvents & Oils

Oils from animal and vegetable sources have negligible action on aluminum. Thus, lard oil, castor oil, cottonseed oil, peanut oil, olive oil, and palm oil are processed in aluminum. Aluminum piping, tubing, and process equipment are also used to handle solvents such as naphtha, benzene, diethyl ether, and others.

Sulphur

One important factor favoring aluminum's use in the chemical and petroleum industries is its high resistance to corrosion by sulphur and sulphur compounds, notably hydrogen sulfide, one of the greatest sources of corrosion in the petroleum field. Sulphur vats, forms, piping, conveyors, hopper cars, and structures of ALCOA Aluminum are used to handle the elemental sulphur.

Alcoa Aluminum in the Process Industries
Alcoa Aluminum Heat Exchanger Tubes
Alcoa Aluminum Pipe and Fittings
Alcoa Utilitube

ALUMINUM COMPANY OF AMERICA, 902-L Alcoa Building, Pittsburgh 19, Pa.

ALCOA
ALUMINUM

ALUMINUM COMPANY OF AMERICA

When inquiring check CP 3426 on handy form, pgs. 2-3

NOVEMBER, 1954

fed back through core when needed. Thorium-bismuth stream would be pumped back through blanket. Fission products formed in blanket would be removed by treatment similar to that used in the fuel processing.

(Summary of paper presented at University of Michigan meeting of American Institute of Chemical Engineers, by Clarke Williams and Francis T. Miles, Brookhaven National Laboratory, Upton, Long Island, New York.)

Vacuum bag molding easier with sealing tape

More efficient and economical molding of polyester glass fiber laminates is said to be possible with a versatile sealing tape. Designed to replace metal forms, gaskets, rings, and C-clamps in hermetically sealing the polyvinyl alcohol blanket or bag in vacuum bag molding, the tape is highly workable and exhibits good pressure-sensitive adhesion.

Extruded in ribbons or beads, tape provides tight seal, eliminating air pockets and bridges when air is pumped out of mold. Sealer is permanently soft, odorless, non-staining, non-bleeding, non-toxic, and will not flow at 300°F.

(579.6 polyvinyl film sealer is product of Presstite Engineering Company, Dept. CP, 3798 Chouteau, Avenue, St. Louis 10, Missouri . . . or for more information reader may simply check CP 3427 on the convenient Reader Service slip which is located between pages two and three.)

Physiological, toxicological testing described in catalog

Services available for physiological and toxicological testing are described in illustrated 16-page catalog. Designed to meet needs of industry, laboratory staff organizes and executes testing programs, acts as consultant, or conducts short-term screening tests to determine potentialities of new products or processes.

Catalog discusses organization's professional staff and facilities available. Handling of work is described — emphasizing confidential treatment. Typical services in 10 fields are listed and explained. Included are toxicology, industrial hygiene, pharmacology, chemistry, microbiology, pathology, entomology, veterinary medicine, dentistry, and medicine.

"The Practical Approach to Your Problems" is issued by the Industrial Bio-Test Laboratories, Inc., Dept. CP, 4122 South Union Avenue, Chicago 9, Illinois. When inquiring specify CP 3428 on handy form, pages 2 and 3.

more than a million!



impulse® steam traps

Starting in 1935, this new idea in steam trapping has earned wide acceptance and approval in practically every industry using steam. More than a million Yarway Impulse Steam Traps have now been sold.

Why? Ask any user. You'll hear reasons like these:

"Quick heating. High, even temperatures"

"Low maintenance"

"Small size, light weight"

"Stainless steel body and working parts"

"Good for all pressures"

"Only one moving part"

"Low cost"

"Immediate delivery from local distributors"

More than 250 Industrial Distributors in the United States and abroad stock and sell Yarways. Write today for the name of the one nearest you.

YARNALL-WARING COMPANY

125 Mermaid Ave., Philadelphia 18, Pa.

® registered



Cut-away section of Yarway Impulse Steam Trap showing only moving part, a small stainless steel valve.

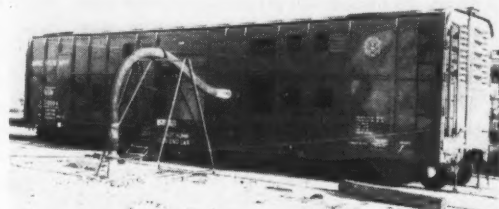
When inquiring check CP 3429 on handy form, pgs. 2-3

IDEAS

Navy's mobile compressor plant supplies 5000 cfm at 125 psi, is in 60-ft box car . . .

operates in any ambient temp from -25°F to 125°F under severe humidity conditions

Built to meet Navy specifications, a pair of heavy-duty air compressors capable of supplying a combined volume of 5000 cfm at 125 psi have been put on wheels. Complete with 500-hp electric motors, switch-



Mobile compressor plant is hooked to 4160 or 2400-volt power supply, connected to line that will carry air into plant, and then is put right to work

board, transformers, cooling and lubricating systems, the 138,000 pounds of equipment is fitted into a 60-ft railway box car.

Each compressor is self-sufficient and mounted on steel skids so that entire unit can be pulled out of car for major

maintenance. All

components are of

standard make. In

operation, car and

equipment vibrate no

more than 0.030

inch in any direction.

Units can operate for

long periods in any

ambient temperature

from minus 25°F to

plus 125°F and under

severe humidity

conditions. Car

meets Association of

American Railroads

requirements for un-

restricted box car

travel in US.

Aside from their

value in emergencies, mobile units are expected to effect considerable economies where need for air is temporary. Large industrial concerns with many plants can give all their production lines standby protection with mobile compressors.

(Mobile compressor was made by Clark Brothers Company, Division of Dresser Operations, Inc., Dept. CP, Lincoln Avenue and 5th Street, Olean, New York . . . or for more information check CP 3430 on handy form, pages 2 and 3.)

**High sensitivity, rapid response
increases accuracy, reliability
of hygrometer readings . . .**

improved instrument takes readings 24 times faster at room temp than those currently used

Improved electric hygrometer of high sensitivity and rapid response has been developed. Device depends on change in electrical resistance of a salt film with change in humidity of surrounding air. Tests indicate that instrument will be particularly well suited to aerological work.

Hygrometer consists essentially of a thin film of salt, such as potassium dihydrogen phosphate, evaporated under vacuum on a specially treated $3 \times 11/16 \times 1/32$ inch flat strip of glass or other insulating material. Water vapor absorbed on surface of this film reaches equilibrium concentration very quickly. Silver electrodes $1/16$ inch wide, fastened to glass, are part of electronic circuit which measures resistance of film, providing continuous record of humidity.

A 63% change in indication, caused by sudden change in relative humidity, takes place in less than $1/2$ second at room temperature and in about 10 seconds at -20°C . In comparison with standard hygrometers in current use, this is a 24-fold increase in speed of response at room temperature and 13-fold increase at -20°C . Rapid response should increase accuracy and reliability of aerological measurements.

(Information courtesy of National Bureau of Standards, US Department of Commerce, Dept. CP, Washington 25, D. C.)

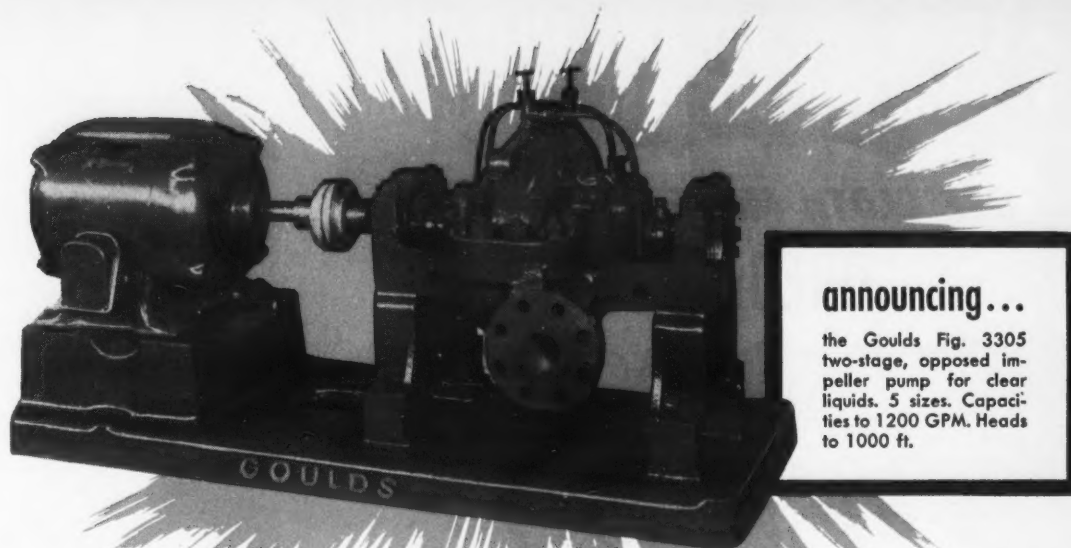
**Scientific reasoning discussed
in 16-page book**

Practical application of tools of scientific method to everyday problems of industry and engineering is covered in 16-page booklet. Written so that the layman as well as the technical person can grasp the contents and apply them, book gives a new slant to some easily forgotten principles.

Starting from basic thought of what reasoning is, booklet covers concept of the sensed difficulty, techniques of establishing the problem, how to state the approach, and method of arriving at sound solutions. Section headings include: "Who Thinks?", "What Thinking Is", "What Meaning Means", "What is So", "Can You Prove It?", and many others.

Important part of booklet is valuable five-step review of basic material which can be used as reminder and guide to clear thinking.

To obtain "Methods of Reasoning" remit \$1.00 direct to Cleveland Engineering Society, Dept. CP, 2136 East 19th Street, Cleveland 15, Ohio. When inquiring specify CP 3431, pages 2 and 3.



announcing . . .

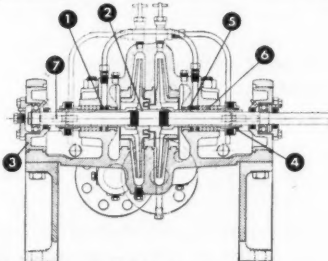
the Goulds Fig. 3305 two-stage, opposed impeller pump for clear liquids. 5 sizes. Capacities to 1200 GPM. Heads to 1000 ft.

**This new Goulds pump offers you 5 specific
operating and maintenance advantages . . .**

To reduce your liquid-handling costs through greater standardization, easier maintenance, and improved operating characteristics, Goulds engineers have developed the new Goulds Fig. 3305 two-stage, opposed impeller centrifugal pump. Here are the highlights—the result of 50 years concentration on industry's centrifugal pump needs.

**1 High operating efficiency,
low maintenance cost**

The Fig. 3305 pump combines the seven features indicated on the sectional drawing below to contribute a quality of dependable service which adds up to true operating and maintenance economy.



- 1 Teflon water-seal rings.
- 2 Stainless steel impeller key.
- 3 Bearing housing sealed against moisture and dirt.
- 4 Cowl-type glands suitable for use with quenching liquids.
- 5 Renewable stuffing box bushings.
- 6 Die-formed stuffing box packing.
- 7 Corrosion-resistant gland bolts.

2 Reduces your spare parts inventory

Only two shaft and rotating parts assemblies provide for 5 pump sizes and 10 pump combinations. This means a remarkable range of parts interchangeability which you will find detailed on page 7 of the descriptive bulletin. Furthermore, most of the components of the Fig. 3305 shaft and rotating assemblies are interchangeable in the Fig. 3405 single-stage, double-suction pump which has won industry-wide acceptance in the year since it was introduced.

This high degree of standardization helps materially to reduce spare parts inventories. It also gives you great flexibility in adapting your Fig. 3305 pump to changing field requirements.

3 Saves space

The short bearing span of Fig. 3305 pumps means considerable saving in floor space—as much as 50% in some comparisons with conventional designs of comparable capacity and head.

4 Stuffing box to match your requirements

You can choose either a conventional stuffing box with gland or a mechanical seal, according to your need. And you can easily change from one to the other at any time.

5 Simple to change rotation

A patented locking device makes it easy to change the rotation of this pump from right-hand to left-hand or vice versa in the field and without additional parts.

Before you select another pump for handling clear liquids at rates up to 1200 gpm and heads to 1000 ft., be sure you have the detailed cost-advantage story of Goulds new Fig. 3305 pump. We'll send you descriptive bulletin—promptly on request.



Get the complete story—This 12-page illustrated Bulletin No. 722.6, covers the new Goulds Fig. 3305 pump completely. It gives specifications, interchangeability tables, performance curves, dimensions.



ATLANTA • BOSTON • CHICAGO • HOUSTON • NEW YORK • PHILADELPHIA • PITTSBURGH • TULSA

When inquiring check CP 3432 on handy form, pgs. 2-3

- CLOTH FOR HOT ACID FILTRATION
- CLOTH FOR HOT DUST COLLECTION

**USE CLOTH MADE FROM
"ORLON"**



This cloth is available in standard width of 38" from stock. We will weave any desired width from 26" through 72" to your order in quantities as low as 100 linear yards.

We have a background of over Forty Years in weaving Industrial Fabrics . . . we weave all of our own Synthetic Fiber Filter Fabrics. We have the "know how" necessary to produce uniform Filter Cloth with outstandingly superior operating characteristics.

Literature and pilot test sample available on request.

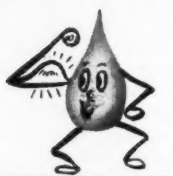
We also weave filter cloth of VINCEL[†], SARAN, DYNEL, NYLON, VINYON N^{**}, GLASS, DACRON^{††}, TEFLON^{***}, POLY-ETHYLENE.

. . . for your Filter Paper requirements try NETONE Filter Paper. High tensile strength, chemical resistant, high burst factor, abrasion resistant and crease resistant. Send for a test sample.

[†]TM for duPont Acrylic Fiber
^{††}TM—NFM Reg. U. S. Pat. OR.
^{**}TM UCC & Co.
^{††}TM for duPont Polyester Fiber
^{***}TM for duPont Tetrafluorethylene Fiber

If high operating temperatures are your problem we suggest you try this NFM cloth made from ORLON^{*} Acrylic Fiber. Here are some of its values:

No loss of strength after 32 days exposure to air at 257° F.



Shrinkage not more than 2 1/2 % in water at 212° F.



Good resistance to hot mineral acids, weak alkalis, common solvents, oils, greases, neutral salts, most acid salts and chlorine.



Weavers of Industrial Filter Media for over Forty Years

The National Filter Media Corp.

General Offices & Mills: New Haven 14, Conn.
Western Office & Factory: Salt Lake City 1, Utah

Sales Offices—Representatives

Chicago, Ill. Cincinnati, Ohio Houston, Texas Oslo, Norway Johannesburg, South Africa
2627 West 19th St. Rossdown Center Bldg. 1503 Hadley Street Nicolai Friis Edward L. Bateman

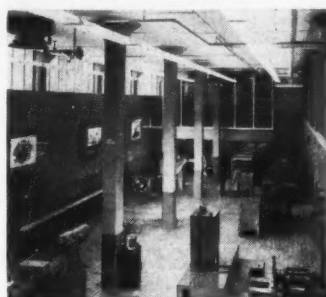
When inquiring check CP 3433 on handy form, pgs. 2-3

IDEAS

Larger, better equipped laboratory for rubber, plastics work . . .

facilities available for developing products, processes

Modern laboratory facilities for experimental and process testing work are available to manufacturers of rubber, plastics, and various other products.



Laboratory is better equipped and three times larger than the one formerly maintained by the company.

Machines installed include Banbury mixers, laboratory mills, plasticator-extruder, three and four-roll calendars, rotocure, hydraulic press, ribbon-type blender, scales, conveyors, and other auxiliary equipment.

(Lab is operated by Farrel-Birmingham Company, Inc., Dept. CP, East Main Street, Ansonia, Conn. Check CP 3434, pages 2 and 3.)

Cl cells getting compact, making less caustic as by-product . . .

European mercury cells gaining popularity in US

Current trends in design of electrolytic cells for the manufacture of chlorine and caustic are: 1) to build them as compact as possible and 2) to produce chlorine with less by-product caustic.

In connection with this, European horizontal and vertical mercury cells are gaining popularity in US.

Comparatively speaking, the American Hooker cell (diaphragm-type) has a lower total cost of investment

unique new "extra secretary"

acclaimed by executives



WHEELER
SOUND POWERED
Electric
TELEPHONES

- ▶ NOW AVAILABLE as a modern, streamlined, executive desk cradle-phone.
- ▶ NO BATTERIES. NO OUTSIDE POWER. No maintenance.
- ▶ Easily installed. Ideal "private wire" to save time, steps, cut switchboard load.



Write now for detailed Bulletin SA-32.

the WHEELER INSULATED WIRE CO., INC.

Division of The Sperry Corporation
1112 East Aurora Street, Waterbury 20, Connecticut
7WHBAA

When inquiring check CP 3435 on handy form, pgs. 2-3

J. E. SIRRINE CO.
GREENVILLE • SOUTH CAROLINA

Engineers
ESTABLISHED 1902



PLANT DESIGN & SURVEYS • CHEMICAL • ELECTROCHEMICAL •
METALLURGICAL PRODUCTION • TRADE WASTE DISPOSAL •
WATER SUPPLY & TREATMENT • ANALYSES & REPORTS

When inquiring check CP 3436 on handy form, pgs. 2-3

CHEMICAL PROCESSING

IDEAS

and operation than the European diaphragm cell. The former also has a competitive cost of operation (including processing of caustic produced) compared to the European mercury cell.

At present, 93% of Europe's total chlorine production is by electrolysis of sodium chloride in diaphragm and mercury cells.

(Summary of paper presented at New England meeting of the American Institute of Chemical Engineers, by Norbert A. J. Platzer, Monsanto Chemical Company, Dept. CP, 1700 South Second St., St. Louis 4, Missouri.)

Film tells importance of clean water

Latest in the "More Power to America" series is 25-minute, full-color, 16-mm sound film designed to create awareness to growing of stream pollution and enlist public and industry support for programs geared to meet problem. Film outlines toll wrought on water resources by pollution, caused in part by rising national population and expanding industrial front.

Dramatizing importance of clean water to individual and his community, film tells of need for immediate action to combat existing and future pollution areas. Film also prescribes remedy: improved expanded water supplies through more industrial waste treatment, modernize municipal sewage disposal plants, and construction of municipal treatment facilities where none exist.

"Clean Waters" was produced for the General Electric Company, Dept. CP, Schenectady 5, N. Y. When inquiring specify CP 3437, pages 2 and 3.

For more information on product at right, specify CP 3438 . . . see information request blank between pages 2 - 3.



Con Edison engineers report:

"We chose FOAMGLAS for underground pipe insulation because it stays dry!"

Consolidated Edison Company's engineers are using waterproof FOAMGLAS to insulate underground heated fuel oil lines at their Astoria, N.Y., Generating Plant. They report: "In this underground installation, our first concern was to get an insulation which would resist moisture and give consistent insulating results under damp conditions. We chose FOAMGLAS because of its moisture resistant qualities."

Con Edison's engineers continue: "Our choice of FOAMGLAS involved maintenance considerations, too. Replacing or servicing insulation in our underground installation would involve considerable

expense. We feel that FOAMGLAS will help us hold maintenance expense to a minimum."

It makes sense . . . if Con Edison can achieve such benefits from FOAMGLAS under difficult operating conditions, you can profit by using this unique, cellular glass insulation. FOAMGLAS laughs at the moisture that cuts efficiency of other insulations . . . and is fireproof and acid-proof, too.

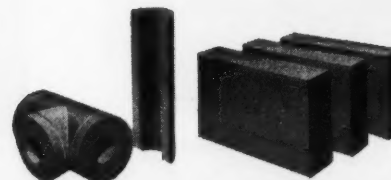
See our catalog in Sweet's Catalog Files . . . or send today for your sample and our booklets describing the use of cellular, stay-dry FOAMGLAS to insulate piping, tanks, and other equipment.



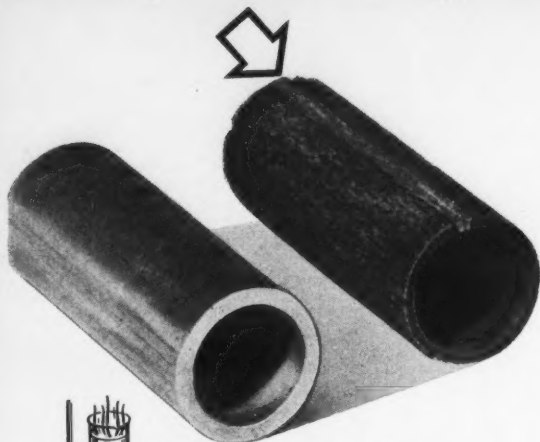
PITTSBURGH CORNING CORPORATION
Dept. CP-114, One Gateway Center • Pittsburgh 22, Pa.

FOAMGLAS®

the cellular, stay-dry insulation



Pittsburgh Corning
also makes
PC Glass Blocks



Lab test shows
corrosion-resistance

of Welded Stainless Steel Tubing

That's a piece of ELECTRUNITE Stainless Steel Tubing on the left. On the right you see it after boiling in a 20 per cent hydrochloric acid solution. And this is what happened:

Wall thickness was reduced from .089 inches to .059 inches.

But the weld area was only reduced to .068 inches. In other words, the weld wasn't subject to preferential corrosion.

This accelerated laboratory test is one proof that the weld area of Republic ELECTRUNITE Stainless Steel Tubing and Pipe is as corrosion-resistant as the balance of the tube wall. More evidence is the fact that Republic has been supplying stainless steel tubing and pipe in all types of processing equipment for the past 25 years.

You can profit from these ELECTRUNITE advantages, whether you choose pressure tubes in carbon or stainless steel analyses. For complete data, write to:

REPUBLIC STEEL CORPORATION Steel and Tubes Division

207 East 131st Street, Cleveland 8, Ohio

GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, New York



When inquiring check CP 3439 on handy form, pgs. 2-3

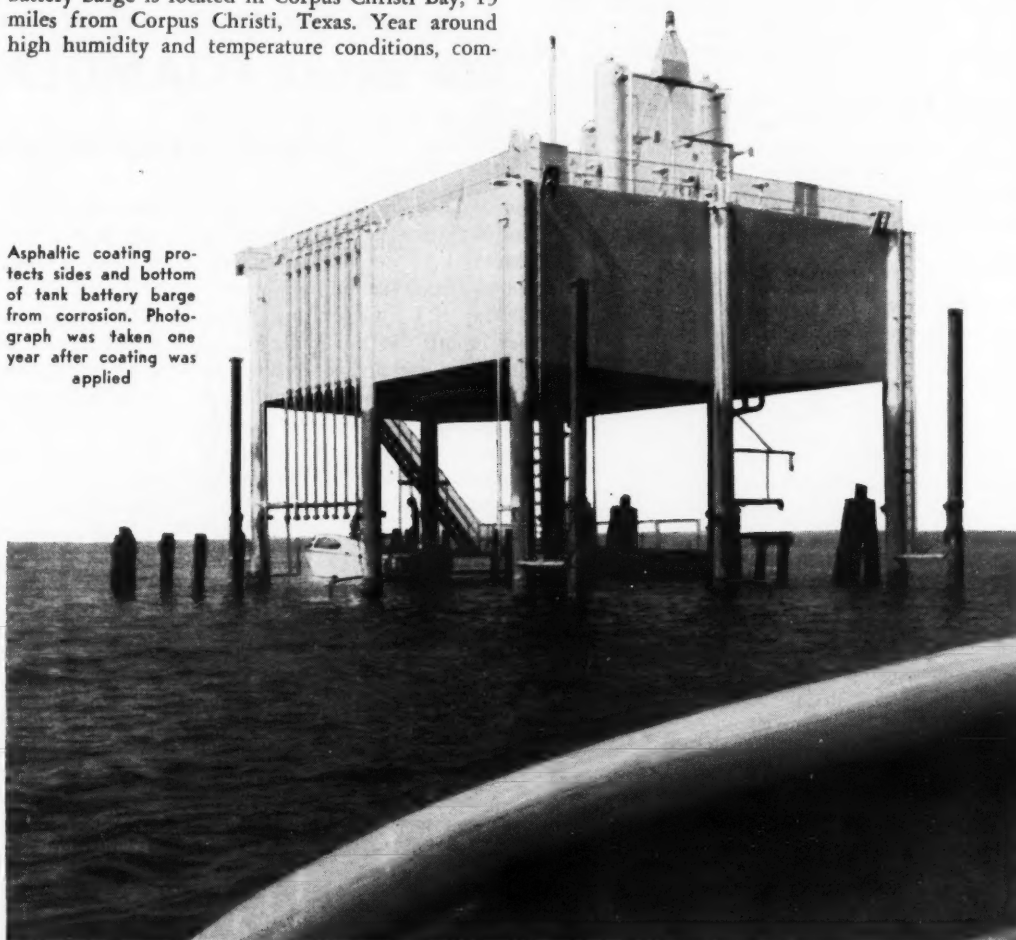
**By coating tank battery barge
with an asphaltic material**

oil company combats corrosive salt air

**Not one case of breakdown of the mastic
can be found any place in the surface of
structure after two years of service**

Problem: A large oil company had to protect tank battery barge shown in accompanying photographs from the effects of corrosive salt air. Tank battery barge is located in Corpus Christi Bay, 13 miles from Corpus Christi, Texas. Year around high humidity and temperature conditions, com-

Asphaltic coating protects sides and bottom of tank battery barge from corrosion. Photograph was taken one year after coating was applied



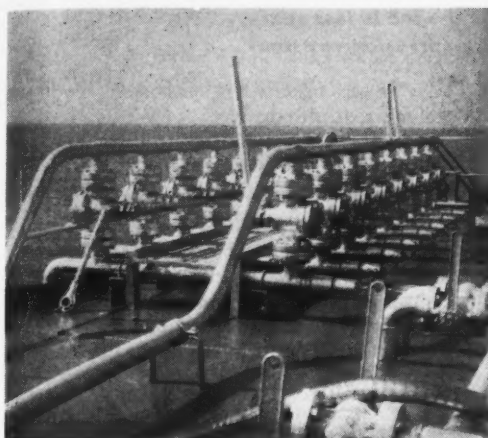
corrosion control

bined with evaporation from the shallow bay (which increases the salt content of the air), make this area one of the most corrosive in the world.

Tank battery barge, which is fabricated from regular steel sheets, stands in nine feet of water. Unit contains four 1000 bbl tanks, which receive oil from surrounding offshore wells. Oil can be handled from eight wells at once. Equipment on top of battery barge separates vapor from liquid. The latter is then stored in tanks below. When tanks are full, oil is transferred to a barge and taken to a refinery. Since a tank battery barge of this type is quite expensive to fabricate and install offshore, it is quite important to provide adequate protection for it.

Solution: In September of 1952, steel sides and bottom of the tank battery barge were coated with a heavy, homogeneous asphaltic material, known as Insul-Mastic No. 4010. Top of the barge and the legs were protected with a vinyl coating.

A large percentage of the asphalt in the No. 4010



Tank battery barge can receive oil from eight offshore wells at once through these intake valves. Manifold was painted with a vinyl coating and then aluminum

coating is Gilsonite, which is more resistant to chemicals and moisture than other types of asphalt. This coating contains from 40 to 55% mineral fillers, the greater portion of which is mica, the most serviceable of the commonly used fillers.

Before applying asphaltic coating, structure was first sandblasted and given a base coat of zinc chromate, fast-drying primer. Primer was applied immediately after sandblasting to avoid exposure of the metal to the salt air for even a short period. Asphalt coating was applied to a thickness of $\frac{1}{8}$ " as soon as possible after primer. A finish coat of aluminum paint was sprayed on afterwards.

In using the asphaltic coating, it is quite important to apply it according to instructions available from the manufacturer if satisfactory results are to be obtained.

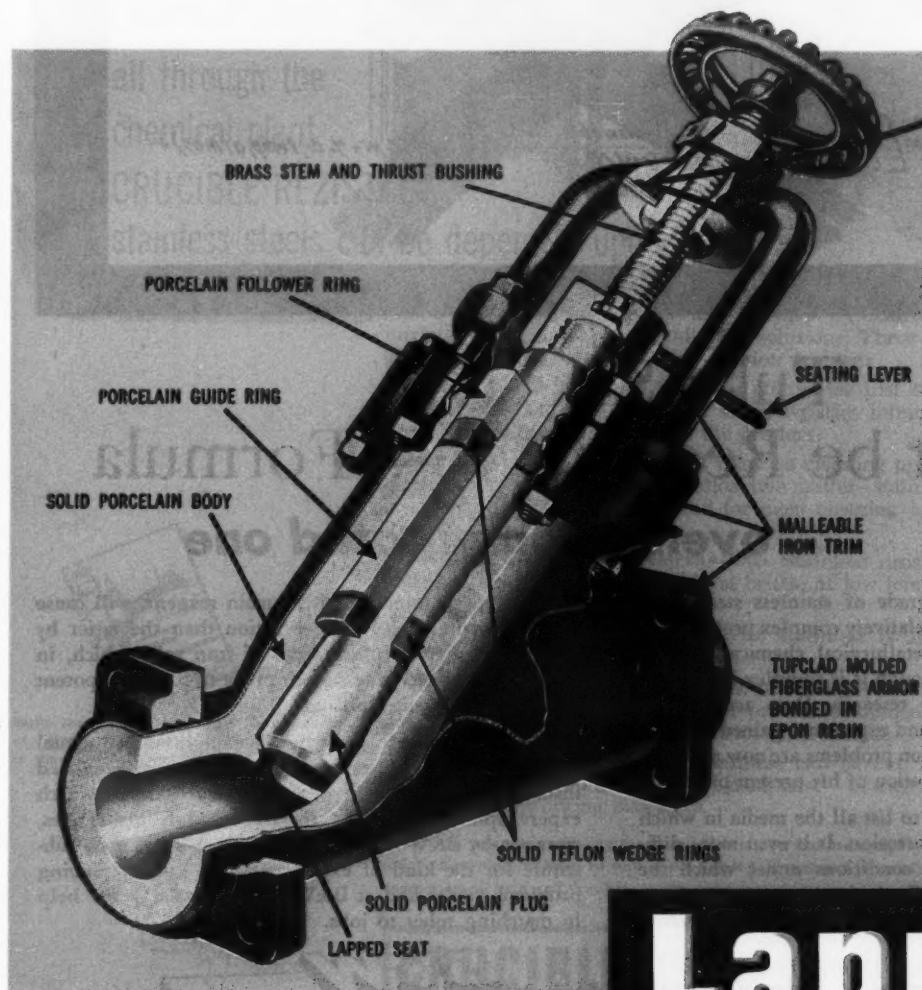
Results: Tank battery barge has been completely protected from the effects of the corrosive salt air during the two years since it was coated. Not one case of breakdown of the mastic can be found any place in the surface of the structure. It is expected that several more years of satisfactory service will be obtained before any extensive repainting will be necessary.

Since, after asphaltic coating is applied, it can be sprayed with selected types of aluminum paint, a favorable appearance is also achieved, as shown. Company furnishing asphaltic coating makes a special aluminum paint, which is compatible with mastic, preventing bleed-through.

(No. 4010 asphaltic coating is product of Insul-Mastic Corp. of America, Dept. CP, 1141 Oliver Building, Pittsburgh 22, Pa. . . or for more information reader may simply check CP 3440 on the convenient Reader Service slip which is located between pages two and three.)

A "cushioned" porcelain-to-porcelain seal in the Lapp Valve

The chemical resistance qualities of the Lapp Valve come from the fact that the body and plug are both *solid porcelain*. Porcelain, as a material, however, has little resiliency or "give" when the plug hits the seat in the body. Special spring-loaded "cushion" seating in Lapp valves prevents damage from a heavy-handed operator, and warns when seal is tight. Built into the thrust bushing of every Lapp Y-valve and angle valve, is an arrangement of tempered Beryllium copper spring washers. This spring loading also provides that a closed valve will maintain its tightness even under vibration and thermal movement of parts.



V-valves, angle valves, flush valves, safety valves, and plug cocks of Lapp Porcelain have standard bolt-circle flanges for easy connection to all piping and equipment. Write for bulletin with complete description, characteristics, and specifications. Lapp Insulator Co., Inc., Process Equipment Division, 525 Wendell St., LeRoy, N. Y.



Lapp

PROCESS EQUIPMENT

Chemical Porcelain Valves • Pipe • Raschig Rings
Pulsafeeder Chemical Proportioning Pumps



When inquiring check CP 3441 on handy form, pgs. 2-3

WHEN CORROSION IS CRITICAL

Optimum tube
for the job = $\frac{[(\text{pressure}) \times (\text{length}) \times (\text{allowable stress})]}{[(\text{flow rate}) \times (\text{cost/ft})]} + (\text{Ni} + \% \text{ Cr, temp, atmos}) +$

Tube Selection Cannot be Reduced to a Formula — even a complicated one

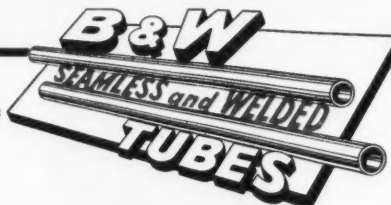
Selection of the proper grade of stainless steel for a particular application is a relatively complex problem and involves manufacturing, metallurgical, chemical and economic considerations. Although it is complex it has been made easier by industrial research. Data accumulated through years of research and experience gained in helping to solve varied application problems are now available to guide the user in the solution of his present problems.

It is practically impossible to list all the media in which stainless steels will resist corrosion. It is even more difficult to enumerate all the conditions under which the stainless steels will resist effectively the corrosive effects of such media. Frequently, a relatively minor contami-

nant, when combined with the main reagent, will cause a more detrimental corrosive action than the latter by itself. This is particularly true of iron salts which, in the presence of chlorides, often prove to be a very potent corrodent, producing pitting.

It is always advisable to test a sample under actual operating conditions, especially before extensive untried installations are made. Proper tube selection starts with expert opinion, available to you through Mr. Tubes, your nearby B&W Tube Representative. There is no substitute for the kind of experience with pressure tubing problems you'll find at B&W. Ask Mr. Tubes for help in matching tubes to jobs.

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing



TA-4061(P)

When inquiring check CP 3442 on handy form, pgs. 2-3

CORROSION CONTROL

**Light, compact heat exchangers
do the job in less space,
are corrosion-resistant . . .**

alloy sheet material is embossed; two are welded to form channels for media

Uses: As heat exchangers for operation in corrosive media in industrial process heating.

Features: Units are available made of corrosion-resistant metals, Hastelloy B and C. Of more than 250 corrosive media tested, Hastelloy B was found fully resistant to 97 and satisfactorily resistant to 40 more. Hastelloy C was found fully resistant to 108 different media and satisfactorily resistant to 54 others.



Five heat transfer units (shown in tank) are supported by simple hanger arrangement and are easily removed

Corrosion-resistant assemblies can be obtained that weigh 50% less than equivalent pipe coils, and require only half the space.

Description: Corrosion-resistant Platecoil heat transfer units are made by embossing 16-gage alloy sheet. Two sheets are then joined by roller-seam welding. Coils are made in sizes up to 83" long and 22 1/4" wide. An exchanger of this size has over 25 sq ft of heat transfer surface, equivalent to over 100' of 3/4" pipe.

(Corrosion-resistant heat transfer units are products of Tranter Manufacturing, Inc., Dept. CP, 602 E. Hazel St., Lansing 4, Michigan . . . or for more information check CP 3443, pages 2 and 3.)

Corrosion-resistant coatings — uses, features, data

Uses, features, and application data on company's line of corrosion-resistant coatings are presented in 12-page bulletin.

Bulletin on Del protective coatings is available from David E. Long Corp., Dept. CP, 220 East 42nd St., New York 17, N. Y. When inquiring specify CP 3444 on handy form, pages 2 and 3.

Wedges in steel gate valves resist corrosion, abrasion

Uses: Gate valve applications where corrosives or abrasives are being handled.

Features: Wedges of valves are made of 13% chrome stainless steel for corrosion resistance and are duracased to at least 1000 Brinell hardness to prevent galling and excessive wear caused by closure on abrasive particles in flow. Stem-to-wedge connection increases pull-out strength.

Description: In union bonnet construction of forged steel valves, a body-to-bonnet joint of male-female type provides a recess for gasket, seating it accurately and securely, reducing possibility of leakage and blown gaskets.

(Forged steel gate valves are products of The Ohio Injector Co., Dept. CP, 103 Main St., Wadsworth, Ohio . . . or for more information check CP 3445 on handy form, pages 2 and 3.)



IS CORROSION LICKING YOU?

Then, be sure to see . . .

the December issue of CP, which will feature the CORROSION CONTROL section. How other plants have licked their corrosion problems will be told in a variety of performance stories. Latest developments in materials and equipment will also be presented . . . plus a host of other topics . . . to complete this important featured section. Remember, it's in December. Don't miss it!!!

In keeping with our policy of "balanced editorial" issues, the other regular sections of CHEMICAL PROCESSING will appear as usual.

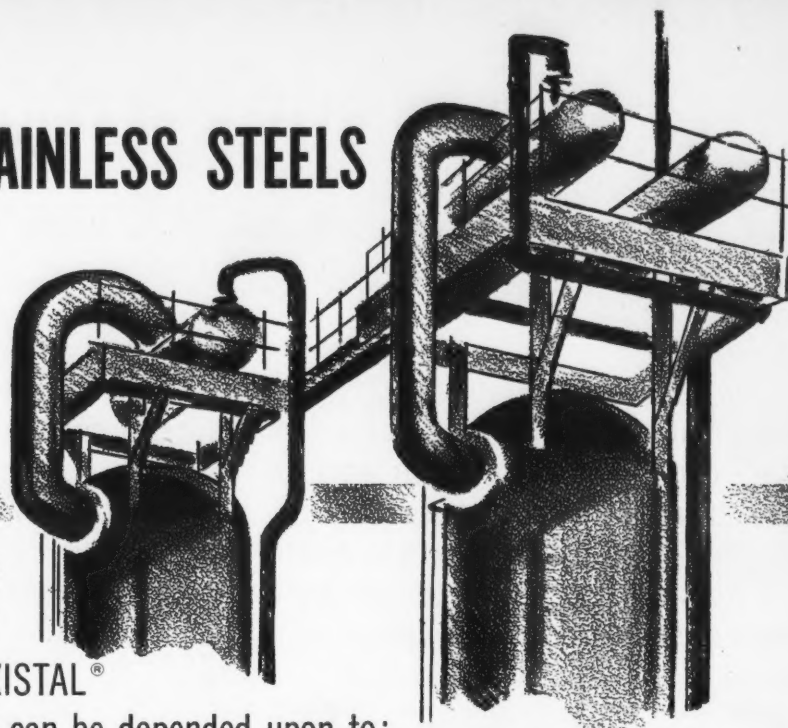
...here's how CRUCIBLE STAINLESS STEELS

serve the
chemical
industry

all through the
chemical plant

CRUCIBLE REZISTAL®

stainless steels can be depended upon to:



RESIST CORROSION: Ordinary air and moisture will not cause stainless to rust. It is almost impervious to attack by oxidizing acids like nitric acid . . . resists strong alkaline solutions. There is a stainless grade to meet most all of your corrosion problem.

PREVENT CONTAMINATION: Stainless eliminates rust from entering process materials. And its inert characteristics minimize metallic ions or deterioration residue in the product.

CLEAN EASILY: For even the most rigorous cleaning problem — that of decontamination to take off radioactive matter—stainless is chosen far more than other metals. And for most cleaning jobs soap and water does the trick.

WITHSTAND EXTREMES OF TEMPERATURE: Stainless resists scaling at high temperatures . . . does not get brittle at low temperatures, as many other metals do.

PROVIDE GREAT STRUCTURAL STRENGTH: Stainless is approximately 50% stronger than ordinary mild steel.

RESIST WEAR AND ABRASION: Because of the alloy content of stainless steels, mixers, chutes and other process equipment made from them will outlast many times those of other metals.

ALLOW COMPLEX FABRICATION: Stainless can be cut, bent, drawn, welded, machined, forged, spun, riveted, cast — fabricated by all the common metalworking processes.

So when you are considering the installation of new process equipment, or the modification of existing facilities, be sure and weigh the advantages of stainless. For practical, down-to-earth help, call Crucible.



Write now for your free copy of "Making the Most of Stainless Steels in the Chemical Process Industries."



CRUCIBLE

first name in special purpose steels

54 years of Fine steelmaking

STAINLESS STEELS

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

REX HIGH SPEED • TOOL • REZISTAL STAINLESS • MAX-EL • ALLOY • SPECIAL PURPOSE STEELS
Canadian Distributor — Railway & Power Engineering Corp., Ltd.

When inquiring check CP 3446 on handy form, pgs. 2-3

USE COOPER ALLOY PRODUCTS AND

Relax!

A quiet day in the country, a golf game at the club, or an afternoon at the ball park—can all be yours if you learn to leave plant problems where they belong. You're on the right road to peace of mind when you specify Cooper Alloy stainless steel products—custom cast-

ings, jet engine rings, valves, fittings, accessories. Our complete control of every step in the processing from design to machining is your assurance of quality. Cooper Alloy know-how means products you can trust—use them with confidence and relax.



FILTER PLATE



VALVE



QUIRK



IMPELLER



PROPELLER



FITTING



MIXER



PUMP CASING



COOPER ALLOY
CORPORATION • HILLSIDE, N. J.

"Stainless Steel Products—custom castings, jet engine rings, valves, fittings, accessories."

CORROSION

While under pressure, valve stem repacked with Teflon . . .

no packing needed for seat of polyvinyl chloride units

Uses: For applications in the chemical and allied industries in places where medium pressures and temperatures not exceeding 160°F are required.

Features: Polyvinyl chloride globe valves are designed so that the stem can be repacked with Teflon packing under full line



Polyvinyl chloride valves for corrosives

pressure. No packing is needed at the valve seat, however, and the disc is easily replaceable. Construction provides a high degree of corrosion resistance.

Description: Valves are made to fit pipe sizes of 1/2, 1, and 1 1/2" while maintaining full flow characteristics. One inch size has been repeatedly tested at 1500 psi and operates at a working pressure of 150 psi at room temperature.

(Polyvinyl chloride valves are manufactured by Stokes Molded Products, Inc., 240 Webster St., Trenton 4, N. J. . . . or for more information reader may simply check CP 3447 on handy form, pages 2 and 3.)

For more information on product at left, specify CP 3448 . . . see information request blank between pages 2-3.

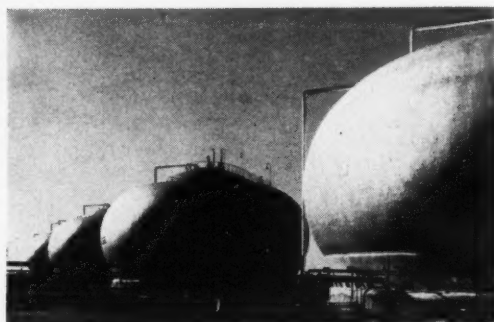
**Aluminum paint gets the nod
for widespread application
at Gulf Oil refinery . . .**

an estimated 11,250,000 sq ft of plant surface are finished with the silvery coating

Corrosion and abrasion resistance, heat and light reflectivity, and bright metallic surface are qualities that have given aluminum paint precedence for widespread application at the Port Arthur, Texas refinery of Gulf Oil Corp. Currently, about eleven million square feet of surfaces at this plant are finish-coated with this silvery paint.

Durability of some applications is as high as eight years, and that of others as low as three years . . . depending on surface preparation and certain exposure conditions. Average durability on tank roofs is three to four years, on tank shells from four to six years, for a finish coat over clean primed surfaces, at a spreading rate of about 325 sq ft/gal.

Aluminum paints generally in use are oil based. However, some high-heat aluminum silicones and vinyls have been tried on a small scale, but results are not conclusive. Economic advantages for alumi-



Butane storage tanks at Gulf Oil have finish coat of asphaltic vehicle aluminum paint, used for its compatibility with asphaltic mastic undercoat

num paint, as observed at Port Arthur are: ease of application, high spreading rates, excellent hiding of under surface, and long-term durability.

(Photo and information courtesy of aluminum pigment producer, Aluminum Company of America, Dept. CP, 1501 Alcoa Bldg., Pittsburgh 19, Pa. Check CP 3449 on handy form, pages 2 and 3.)

Trying to cut corrosion costs? . . .

Your guide to corrosion-resistant products and materials is the handy Product Directory on pages 213 to 216. All subjects discussed in this issue of CHEMICAL PROCESSING are listed there.

**wherever
corrosives
flow...**

try NEW DUR-ACE PIPE

**a tough, corrosion-resistant plastic
with a good cost factor**

Dur-Ace is a new corrosion-resistant, rigid plastic pipe with exceptional impact strength and toughness . . . good for handling most corrosive fluids in your plant at moderate temperatures and pressures . . . with low first cost and long life.

Light in weight, Dur-Ace is odorless, tasteless, and non-contaminating. It maintains good strength, rigidity and chemical resistance from minus 40 deg. F. to 170 deg. F. As shown below, it handles all types of chemicals except a few strong acids and organic solvents. Dur-Ace is corrosion-resistant on the *outside* too, and saves the cost of painting. Electrolytic corrosion and bacteria have no effect on Dur-Ace, so it's excellent for underground lines handling water, brine, petroleum, natural gas, etc.

Successful field installations of thousands of Dur-Ace molded fittings have been made. We have job-proved performance data covering a wide variety of corrosives. Dur-Ace is available in pipe sizes from 1/2" to 2", Standard and Extra Heavy, with a wide variety of fittings.

Dur-Ace is the eighth basic type of corrosion-resistant pipe available from ACE . . . including materials for high pressures, high temperatures, strong acids, organic solvents, etc., and pipe sizes to 24" and above. Consult ACE first with any corrosion problem.

CHEMICAL RESISTANCE AT 77 DEG. F.

SATISFACTORY

Acetic Acid 10%
Hydrochloric Acid 30%
Sulphuric Acid 50%
Ammonium Hydroxide 28%
Calcium Hydroxide
Sodium Hydroxide 20%

Ferric Sulphate
Salts of Calcium,
Sodium, Potassium,
Ammonium, etc.
Bleaches
Metal Plating Salts
Oil (SAE 10-30)

LIMITED

Formic Acid 20%
Hydrofluoric Acid 10%
Nitric Acid 10%
Phosphoric Acid 50%
Alcohols
Vegetable Oils

UNSUITABLE

Acids stronger than listed at left
Aromatic Hydrocarbons
Chlorinated Solvents
Esters
Ketones



WRITE FOR BULLETIN 80A TODAY.

ACE rubber and plastic products

AMERICAN HARD RUBBER COMPANY
93 WORTH STREET • NEW YORK 13, N. Y.

When inquiring check CP 3450 on handy form, pgs. 2-3

**Acid fumes combated
by neoprene coating
on blower . . .**

has indicated service life of
several years

In a recent blower installation protection is provided from the acid fumes handled by a neoprene maintenance coating. Coating is expected to last for several years, eliminating corrosion and pitting on the fan and housing.

Coating is a one-solution product, no accelerator or primer being required. Each coat dries in two hours and gives a thickness of 5 to 10 mils. It will adhere firmly to metal, concrete, wood, plastic, glass and other surfaces. Coverage is 75 to 100 sq ft per gallon. Standard color is black but aluminum and other colors are available.

(Magic-Vulc Neoprene Maintenance Coating No. 245-B is product of Magic Chemical Co., Dept. CP, 121 Crescent St., Brockton 2, Mass. . . . or for more information check CP 3451, pages 2 and 3.)

**Heat, time, and pressure
bond silver to other
metals . . .**

process gives hard, uniform
finish as thin as .00001"

Uses: Corrosion-resistant applications, and where high conductivity, in conjunction with strength and rigidity of base metal, is required.

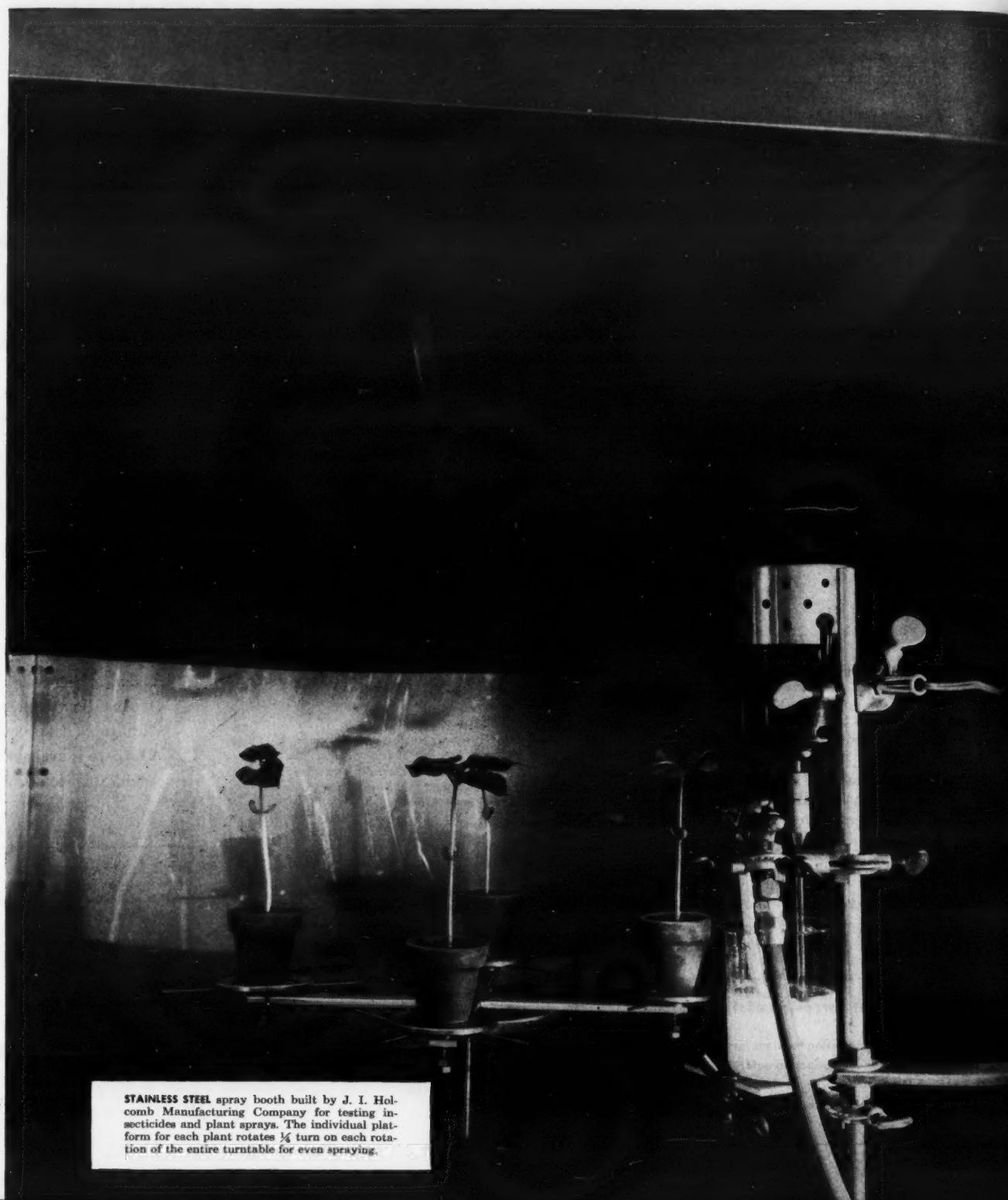
Features: Process involving heat, time, and pressure results in a flawless and permanent metallurgical bond in which the clad layer of silver is hard and dense. Cladding can be as thin as ten millionths of an inch (.00001").

Description: Clad metals are produced overlaid on one or both sides, in inlaid stripes and edge-clad. They are custom rolled in strip up to 4" wide, in total overall thicknesses down to .001" with overlay thicknesses down to .00001".

Selection of clad metals made

IN THE LABORATORY . . .

J. I. Holcomb takes advantage of Stainless

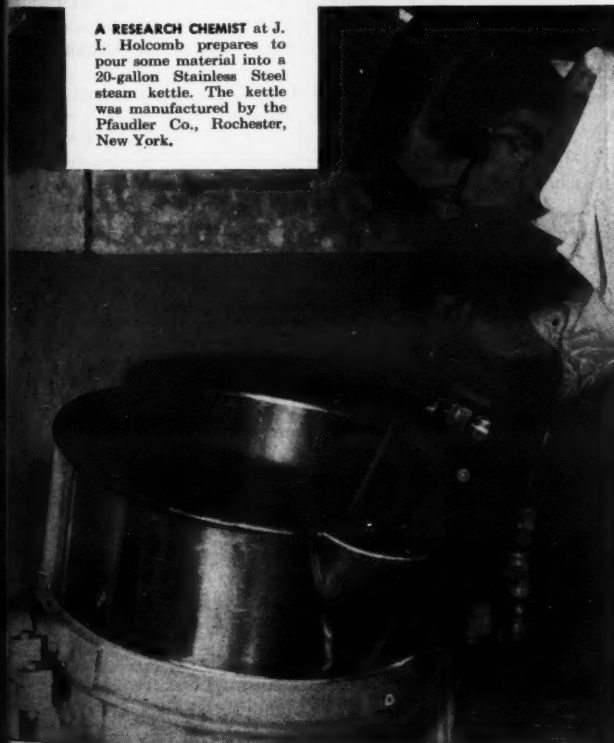


STAINLESS STEEL spray booth built by J. I. Holcomb Manufacturing Company for testing insecticides and plant sprays. The individual platform for each plant rotates $\frac{1}{4}$ turn on each rotation of the entire turntable for even spraying.

Steel's corrosion resistance and cleanliness



PORTIONS of the eight Stainless Steel filter plates can be seen in this Niagara Filter at J. I. Holcomb Manufacturing Company. In a half day, this filter handles 2000 gallons of soap at pressures up to 70 psi.



A RESEARCH CHEMIST at J. I. Holcomb prepares to pour some material into a 20-gallon Stainless Steel steam kettle. The kettle was manufactured by the Pfaudler Co., Rochester, New York.

Manufacturing a variety of cleansers, waxes, soaps, sprays and insecticides for industrial, commercial and institutional uses, J. I. Holcomb Manufacturing Company, Indianapolis, Ind., must meet the specialized and critical nature of its markets with high standards of quality.

As a result, the firm makes full use of Stainless Steel, both in the laboratory where many of the products are developed and in their manufacturing operations.

A special spray booth for testing all kinds of insecticides and plant sprays has been constructed entirely of Stainless Steel. Booths made of wood tend to carry over traces of one spray test into the next. Ordinary metals cause difficulty because of the corrosive natures of both the insecticides and the cleaning solvents. But Stainless Steel's gleaming surface can be kept clean easily with the use of solvents.

A 20-gallon Stainless Steel test kettle has been in use for about one and one-half years handling all types of formulations and organic reactions. Probably its most severe test was encountered when ferric chloride was employed as an oxidizing agent in converting one organic chemical to another at 100°C. The reaction was completed satisfactorily and the kettle came through unscathed.

In manufacturing operations, a filter lined with Stainless Steel has been in service eight years. It handles four different soaps manufactured for industrial and institutional uses, filters out unsaponifiable materials to clear the mixtures.

You, too, will find, like this satisfied company, that Stainless Steel equipment can eliminate many problems of corrosion and cleanliness, both in the laboratory and in production operations. And when you order Stainless equipment, be sure the fabricator uses perfected, service-tested USS Stainless Steel.

UNITED STATES STEEL CORPORATION, PITTSBURGH
AMERICAN STEEL & WIRE DIVISION, CLEVELAND
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS STAINLESS STEEL

SHEETS • STRIP • PLATES
TUBES • WIRE



BAR • BILLETS • PIPE
SPECIAL SECTIONS

4-1020

available by process includes: non-precious to non-precious — example, phosphor bronze on copper; precious to non-precious — example, silver on beryllium copper; and precious to precious — example, palladium on silver.

(Clad metal process is a development of Industrial Division, American Silver Co., Inc., Dept. CP, 36-07 Prince St., Flushing 54, N.Y. Check CP 3452, pgs. 2 & 3.)

Introduce valves of PVC...

sizes range from 1/2 to 2"

To its Saunders diaphragm valve line, company has added units with bodies of polyvinyl chloride. Hand-wheel operated, lever operated, sliding stem, and air-operated mod-



els are available. Sizes range from 1/2 to 2". Screwed ends are standard and slip fits are available on special order.

(PVC diaphragm valves are products of Hills-McCanna Co., Dept. CP, 3025 N. Western Ave., Chicago 18, Ill. Check CP 3453 on handy form which is located between pages 2 and 3.)



For more information on product at left, specify CP 3454 ... see information request blank between pages 2-3.



these packings last

months

instead of

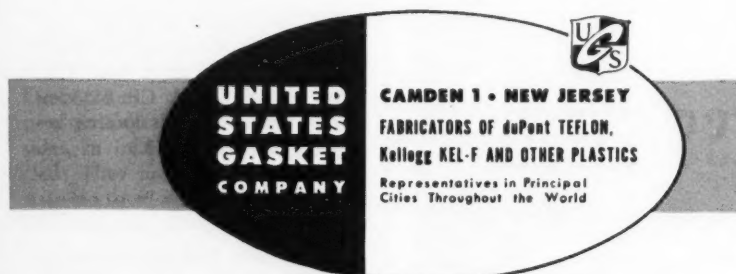
hours

CHEMISEAL PACKINGS

... for Valves. Engineered packings of chemically inert, non-contaminating duPont TEFLON. V-Rings, cup and cone, and wedge types designed for maximum flexibility and resiliency. Provide necessary seal with the low gland pressure required for use in valves made of such materials as ceramics, Havg, Karbate, glass-lined steel, etc. Extremely anti-hesive surfaces reduce to a minimum torque required to operate valves. Outlast other packings many times over in difficult chemical services.

... for Pumps. Three types—pure TEFLON, TEFLON with Graphite and TEFLON with Mica. Handle all types of corrosive materials including hazardous chemicals. Ideal for non-contaminating service in the manufacture of pharmaceuticals, biologicals, foods, etc. Impose low friction load on shaft, are long wearing.

Write for Catalog No. TP-1053



When inquiring check CP 3455 on handy form, pgs. 2-3

CORROSION CONTROL

One good way to introduce plastics in chemical plants is to use them for emergency repairs . . .

case histories of how they have solved problems illustrate the point

Experience has shown that one of the easiest and possibly best ways to introduce plastics into chemical plants is to use them as emergency maintenance materials. Information secured from these exposures is usually of more value than extensive laboratory tests. Case histories known to the author of this research paper illustrate the point.

In July 1952 a Type 17 chrome stainless steel storage tank used for storing 60% nitric acid failed. Since welding repairs were almost impossible to make in the field, entire tank was wrapped with a fiber glass polyester covering. Cost was only a fraction of that of a new stainless tank. Tank has been in service over 1½ years and is still in excellent condition. In another case this same plastic gave good service handling alum.

In another operation a self-supported glass fiber reinforced furane resin was unattacked in three years service handling gases containing sulfuric acid mist and considerable SO₂ and SO₃. A rigid vinyl duct system has given several years service handling a gas containing bromine at temperatures approaching the boiling point of water.

In another case it was necessary to find some material that would withstand 70% sulfuric acid solution at 150°F. Problem was solved by the use Saran-lined steel pipe which has been in service over two years with no indication of trouble.

Author points out that one thing that is needed is a good non-destructive test for the physical properties of reinforced plastics.

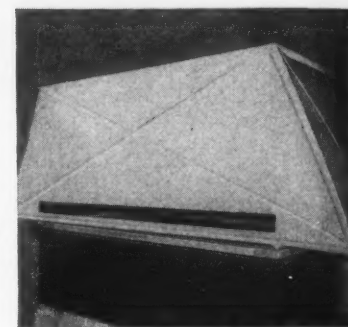
(Condensed from technical paper, "Use of Plastics as Materials of Construction in the Chemical Industry," by S. W. Shepard, Chemical Construction Corp., Dept. CP, Linden, N. J. Paper was published in Corrosion, Vol 10, No. 7, 215-216 (1954) July.)

Common ailments of valve stems avoided by alloy

Company's line of bronze globe and angle valves incorporates a stem of special alloy that is inhibited against dezincification, corrosion, and other common stem ailments. Features of valves, which are described in bulletin, include seats and discs of cutlery grade stainless steel.

Bul 110 is available from The Kennedy Valve Mfg. Co., Dept. CP, 1021 E. Water St., Elmira, N. Y. When inquiring specify CP 3456 on handy form, pages 2 and 3.

THIS PLA-TANK® HOOD SAVED ITS COST IN A YEAR



The PLA-TANK Hood shown above has been in continuous use at General Electric's small aircraft engine department in West Lynn, Mass., for over a year. Reports indicate that it is still as good as when originally installed, is already credited with saving its entire cost since no previously used material had lasted over a year.

The tank is used for etching stainless steel billets; solutions used are aqua regia at room temperature and a 50% solution of muriatic acid at 180°F. PLA-TANK has successfully withstood these fumes, where other materials failed.

PLA-TANK products are daily solving problems of all types in the chemical and electroplating fields. They replace or outlast stainless steel, lead and ceramic linings, plywood coated with corrosion preventatives, phenolic plastics and asbestos cement board structures in many applications.

PLA-TANK, molded from long-life, resin-bonded glass fibre laminate, is now resistant to a wider variety of fumes and temperatures than ever before. PLA-TANK is light weight, easy to install, competitively priced.

Let us help you solve your problems the modern way — with PLA-TANK. Write today for free data sheets.

P-21



When inquiring check CP 3457 on handy form, pgs. 2-3

CHEMICAL PROCESSING

High chemical resistance with polyethylene filter cloth . . .

fabric is free-flowing and easily cleaned

Polyethylene filter cloth provides excellent chemical resistance in a monofilament fabric which is inherently free-flowing, easily cleaned, and slow to blind. Product has a minimum of shrinkage from temperature effect alone up to 212°F.

In addition to resistance to chemicals, filter cloth withstands attack from mold, mildew, moths, and sunlight. Moisture absorption factor is less than 0.01%.

(For further information on NFM polyethylene filter cloth contact The National Filter Media Corp., 1717 Dixwell Ave., New Haven 14, Conn. . . or check CP 3458 on handy form, pages 2 and 3.)

Safe conduct of acids in rubber hose . . .

tube compound withstands concentrated solutions

Field and laboratory tests show that hose tube compound developed by company makes possible safe conduct of concentrated acid solutions in rubber hose. Sulfuric acid 66° baume, 70% hydrofluoric acid, concentrated chromic acid, and concentrated nitric acid were carried by hose without deteriorating effect. Both suction and discharge hose are available in a variety of sizes.

(Acid hose is a product of Lee Rubber & Tire Corp., Republic Rubber Div., Dept. CP, Youngstown 1, Ohio . . . or for more information reader may simply check CP 3459 on the convenient Reader Service slip which is located between pages 2 and 3.)

For more information on product at right, specify CP 3460 . . . see information request blank between pages 2 - 3.

DESIGN and PRODUCTION NEWS

FOR DESIGN AND MATERIALS ENGINEERS

Published by TECHNICAL SERVICE, Chemical Manufacturing Division, The M. W. KELLOGG Company

NOV. 1954

Smaller, Lighter Rupture Discs . . . Lined With KEL-F® Plastic . . . Now Used In Highly Corrosive Systems

Using coatings and seals of KEL-F plastic to overcome corrosion, lightweight, small rupture discs of aluminum now provide protection for low pressure and vacuum vessels. Discs with bursting pressures ranging from 5 to 100 psig are now possible. Premature bursting due to corrosion has been eliminated. Discs are smaller and afford a greater degree of pressure control than previous types.

A lining of KEL-F plastic on the standard (right) and a film seal in the new "lug" type rupture disc (left) permit them to be used safely with practically all corrosive materials, at temperatures up to 250°F.

Black, Sivalls & Bryson, Inc., Kansas City, Mo. manufacturers of control equipment, pioneered this use of KEL-F plastic film.

**For further information ask for
Application Report C-119**

For complete information regarding any item mentioned in DESIGN AND PRODUCTION NEWS, ask for detailed APPLICATION REPORTS, write

Technical Service
**CHEMICAL
MANUFACTURING
DIVISION**
THE
**M. W. KELLOGG
COMPANY**
P. O. Box 400, Jersey City 3, N. J.
or offices in Boston, Chicago, Dayton
Los Angeles and New York
KELLOGG **PULLMAN**

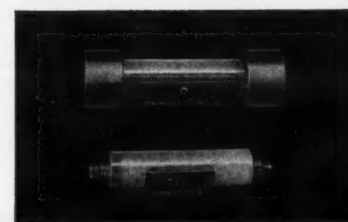


HF at 300°F Handled by Flowmeters of KEL-F® Plastic In Atomic Plant ... Still "On Stream" After 2 Years!

Clarity, dimensional stability, accuracy and damage resistance make these flowmeters made from KEL-F polymer outstanding. In contact with extremely corrosive hydrogen fluoride for two years on low-pressure purge lines, they show no signs of "giving up".

Chemically-inert, the plastic tubes are unattacked by the HF even at 300°F. Machined to precision dimensions, they maintain original metering accuracy. Flow tubes have remained clear to permit easy float visualization.

The Brooks Rotameter Company, Lansdale, Pa., produces these corrosion-resistant flowmeters. Flow tubes are machined of rod extruded from



KEL-F polymer Grade 300 by the United States Gasket Company, Camden, New Jersey.

**For further information ask for
Application Report C-130**

KEL-F

TRIFLUORO
CHLORO
ETHYLENE
POLYMERS

KEL-F

MOLDING
POWDERS

KEL-F

FLUORO
CHLORO
CARBON
PLASTIC

KEL-F

DISPERSION
COATINGS

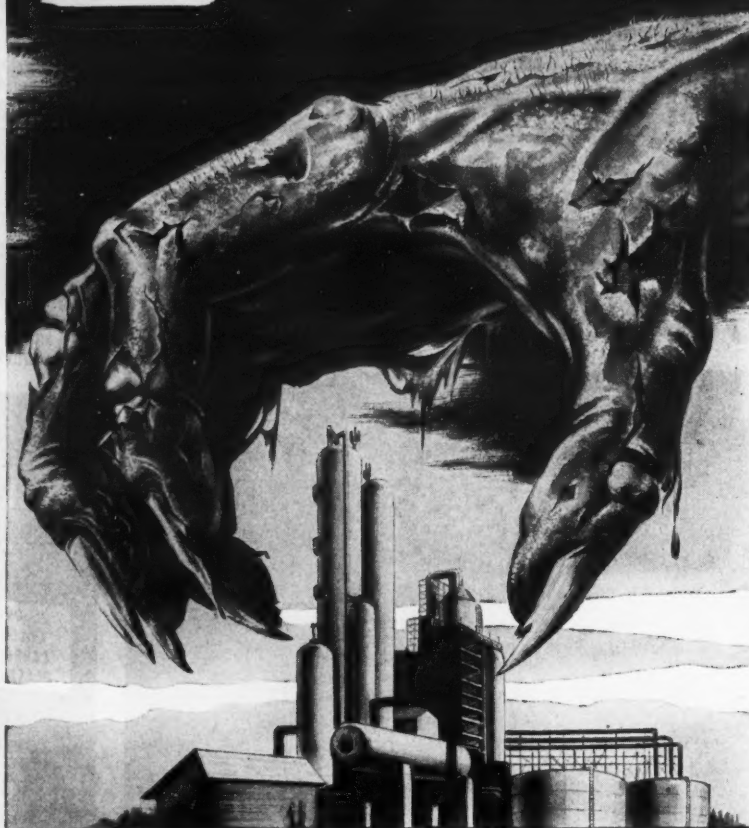
KEL-F

TRIFLUORO
CHLORO
ETHYLENE
POLYMERS

KEL-F

OILS
WAXES
GREASES

STOP COSTLY CORROSION!



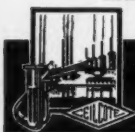
1907-CC

... WITH THE CEILCOTE COATING BEST SUITED TO YOUR PLANT CONDITIONS

CEILCOTE experience takes the "mystery" out of selecting the proper protective coating. Because no single coating will meet all corrosive conditions, CEILCOTE offers eight different types of organic coatings including phenolics . . . asphaltums . . . gilsonites . . . coal tar . . . epoxys . . . polyesters . . . vinyls and furfuryls.

Because CEILCOTE provides a complete range of laboratory tested and field proven protective coatings, there is no need to compromise . . . there is one particular coating best suited to meet your conditions. Send us the details and our staff of chemical engineers will evaluate and recommend a solution to your industrial coating problem.

Write today for new 8 page brochure (No. 150) giving complete information on base formulation . . . adhesion . . . abrasion resistance . . . chemical characteristics . . . film thickness and cost.



THE CEILCOTE COMPANY
CORROSION-PROOF MATERIAL AND CONSTRUCTION

4834 RIDGE ROAD

CLEVELAND, OHIO

When inquiring check CP 3461 on handy form, pgs. 2-3

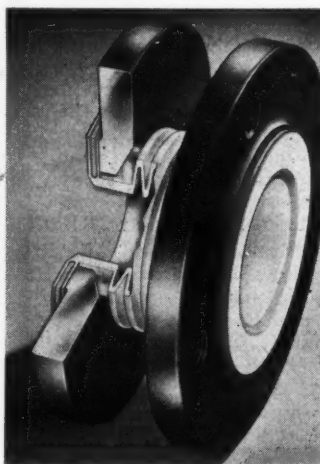
CORROSION

Form of Teflon bellows gives greater strength, more flexibility . . .

products fit any pipe size from 1/2 to 12"

Uses: Typical applications include vibration dampeners, expansion joints and connectors, metering pumps, pressure accumulators, batching scales, hydraulic systems, and others.

Features: Convolution form of bellows is said to give greater strength, longer life and increased flexibility. Since they retain formation at full free length, they are subjected to minimum residual and working strain. They expand and contract in either direction with equal freedom of motion.



Bellows flanges provide efficient sealing at low pressure

Description: Chemically inert, corrosion- and heat-resistant bellows are made of Teflon.

They are available with companion flanges conforming to American Standard bolt hole circles and numbers for pressures up to 125 psi. Operating temperature range is from -94 to 500°F. Bellows can be supplied to fit any pipe size from 1/2 to 12".

(Teflon bellows are a product of Crane Packing Co., Dept. CPC, 1800 Cuyler Ave., Chicago 13, Ill. . . . or for more information check CP 3462, pages 2 and 3.)

FERRIC CHLORIDE SOLUTION

heated without Corrosion

Evaporating water from a ferric chloride solution in an operation to reclaim hydrochloric acid is accomplished economically by a Submerged Combustion installation rated at 60,000,000 BTU per hour. Heat transfer surfaces do not corrode because they are the walls of bubbles in the liquid. In fact, this installation operated steadily for three years before even minor parts replacement was required.

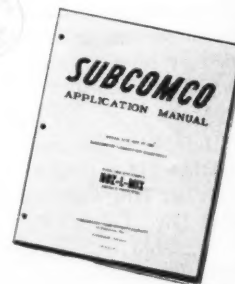
Safety of operation is assured by the exclusive NOZ-L-MIX[®] principle, which keeps gas and air separate until they reach the point of actual flame.

If you are processing chemicals or treating metal ores it will pay you to find out how you can heat corrosive liquid at top speed and at lower cost with Submerged Combustion equipment.

We'd like to show you proof of these statements and explain how Subcomco[®] equipment can be applied to your operation. Get in touch with us today.

APPLICATION MANUAL
SUGGESTS PRACTICAL
COST CUTTING METHODS

Send for Your Free Copy



Submerged Combustion

COMPANY OF AMERICA, INC.

765 LOGAN STREET

HAMMOND, INDIANA

A Quarter-century of Service to American Industry

When inquiring check CP 3463 on handy form, pgs. 2-3

CHEMICAL PROCESSING

**Economical improvement in cast irons
for 1200-1300°F service provided
by addition of 1-3% Ni and Cr . . .**

when greater loads must be carried at 1200°F,
high alloyed cast irons can be used

Recent laboratory tests show that in cases where load carrying capacity is of little importance, addition of 1 to 3% nickel and chromium offers an economical improvement in cast irons in service up to about 1200 or 1300°F. Hence, for a number of applications in moderately elevated temperature service, a satisfactory service life can be obtained at low relative cost.

Although gray chest irons are generally not required to carry appreciable loads at temperatures up to 1200°F, stress rupture data indicate that Ductile Iron, Ni-Resist, and Ductile Ni-Resist can carry appreciable loads. These data, together with the good oxidation resistance of these special cast irons, suggest a wider use of these metals in moderately high-temperature service.

Until recently, cast irons for many applications have been compared principally on their comparative growth properties. In this investigation, it was found tests on the rate of oxidation of oxygen penetration rates evaluated the life expectancy more accurately.

(Condensed from technical paper, "Cast Irons in High Temperature Service," by Richard J. Greene and Frederick G. Seifing, The International Nickel Company, Inc., Dept. CP, 67 Wall St., New York 5, N. Y. Paper was presented at the 1954 annual meeting of the National Association of Corrosion Engineers in Kansas City, Mo.)

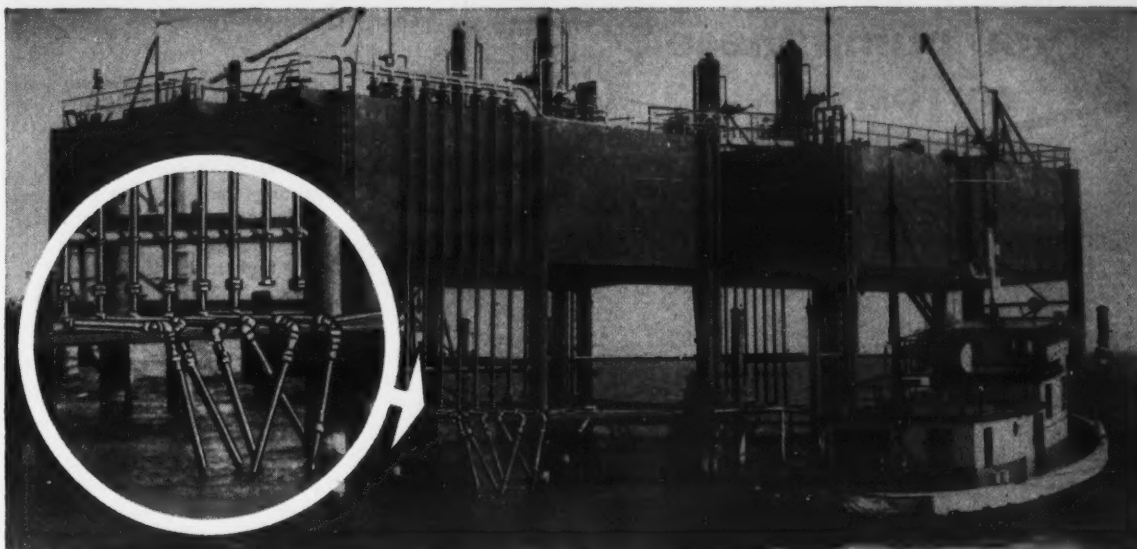
**Chemical resistance of Teflon
incorporated in filter cloth
with controlled pore size**

Uses: Filtering operations involving low or high temperatures, or corrosive materials.

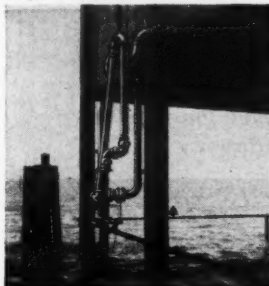
Features: Corrosion and high-temperature resistance of Teflon is engineered into fabric with controlled pore size. Tensile strength of material is said to be twenty times that of solid Teflon. Low coefficient of friction, high water repellency, and small affinity for adhesives of all fibrous materials results in cake removal regardless of material filtered.

Description: Woven Teflon filter cloth, designated CPS (controlled pore size), is available in two grades: the finer for removal of particles 25 microns and over, and the coarser for particles 40 microns and over. Lower service temperature limit is -100°F, upper limit is 400 to 525°F.

(Teflon filter cloth is a product of Porous Plastic Filter Co., Dept. CP, 30 Sea Cliff Ave., Glen Cove, N.Y. . . . Check CP 3464, pages 2 and 3.)



Chiksan swivel joints are used on the 12 underwater lines on this portable submersible tank battery barge which stores oil from 12 wells. Three swivel joints are used on each line to provide necessary flexibility and safety against storms, wind and waves. Visible in this photograph are style 50 Chiksan joints. Style 10 and style 50 joints are below the surface.



Each submersible tank battery has a 6" or 8" CHIKSAN aluminum Marine and Barge Loading Hose that permits unloading of oil to the barges.



After 3 years of under-water service this CHIKSAN Marine Swivel Joint has been raised from 14 feet of water 13 miles from shore to service the packing.



Same CHIKSAN joint being cleaned of marine growth after re-packing and preparatory to re-submerging for years more of safe and economical service.

Davey Jones' Locker

**IS FULL OF CHIKSAN MARINE
SWIVEL JOINTS . . . 3 Years of Storms, Wind
and Waves Have Proved the Flexibility, Economy and Safety of
CHIKSAN Marine Swivel Joints in Submerged Salt Water Service.**

In the bays along the Texas and Louisiana Gulf Coast submersible tank-battery barge storage and transfer of oil has been made both possible and practicable with the application of CHIKSAN Marine Swivel Joints to the under-water flow lines.

In waters that range from 8 to 35 feet deep and with pressures up to 2100 psi. CHIKSAN joints have given the necessary flexibility of flow lines, economy of transport and safety of operation in transferring oil for distances in excess of 13 miles under water without line rupture or loss of product. Tight bends and connections on the flow lines between well platforms, tank batteries, metering platforms or drilling structures in the operation of off-shore locations that could not withstand the "Sunday Punch" of wind, waves and dragging boat anchors, are eliminated by the use of CHIKSAN swivel joints.

CHIKSAN'S special design submersible Marine Swivel Joints have once again solved a costly and perplexing problem of the Petroleum Industry.

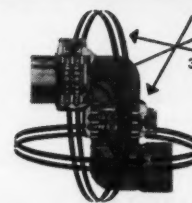
Write CHIKSAN Engineering and Research for complete details. Dept. CP-11

The Flow of Enterprise Relies on

CHIKSAN

Ball-Bearing Swivel Joints

THE NEW TOOL OF MODERN INDUSTRY

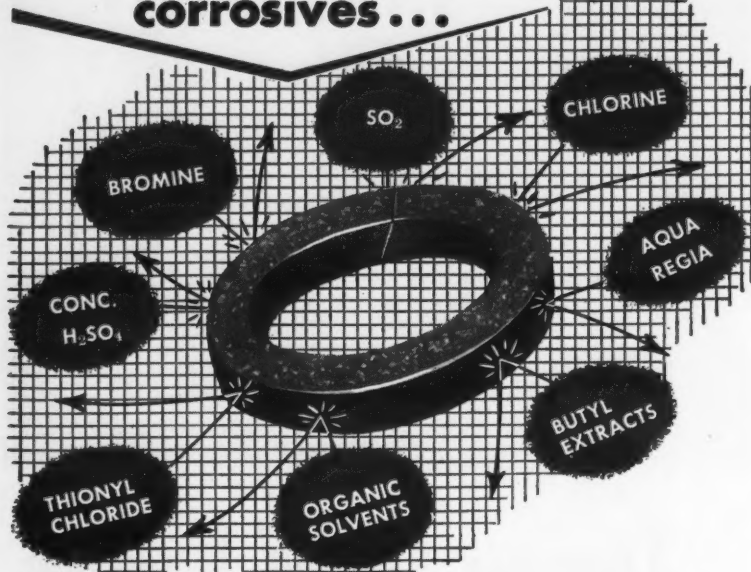


CHIKSAN Ball Bearing Swivel Joints are THE NEW TOOL of Modern Industry with full 360° rotation in 1, 2, and 3 planes. Over 1,000 different types, styles, and sizes have been developed for pressures and services from 20" vacuum to 15,000 psi and for temperature ranges from minus 70° to plus 500° F. with packing materials for each specific service.

CHIKSAN COMPANY • BREA, CALIFORNIA • Chicago 3, Illinois • Newark 2, New Jersey
Well Equipment Mfg. Corp. (Division), Houston 1, Texas • Subsidiaries: Chiksan Export Co., Brea, Calif.; Newark 2, N. J. • Chiksan of Canada Ltd., Edmonton, Alta.

When inquiring check CP 3465 on handy form, pgs. 2-3

**If you pump these
corrosives...**



Get months of Trouble-Free service with CHEMPRO TEFLON PACKINGS

If your pumps and valves handle highly corrosive industrial chemicals, CHEMPRO TEFLON PACKINGS will drastically cut packing replacement and maintenance costs. CHEMPRO Packings last for many months under corrosive conditions which make ordinary packings useless in days or even hours. They stop leakage by providing a tight seal at only slight gland pressure, and their very low coefficient of friction often makes lubrication unnecessary.

TEFLON* PLASTIC STUFFING BOX PACKING

Ideal for either centrifugal or reciprocating pumps operating at speeds up to 3600 R.P.M. handling corrosives at temperatures from -118° F. to 525° F. Style No. 101 composed of 94% shredded Teflon and chemically inert graphite as a friction reducer. Style No. 201 same as No. 101 except that mica is used as friction reducer. Both styles made to fit every size stuffing box on standard process equipment.

TEFLON V-TYPE PACKINGS

For reciprocating pumps and hand, air and motor operated valves handling corrosive materials. Lips of very sensitive pressure rings expand proportionately to increased operating pressure thereby preventing leakage. Suitable for temperatures from -150° F. to 550° F. Unsuitable for centrifugal or rotary pumps. Supplied in bulk or in complete sets to fit specific stuffing boxes.

Chemical & Power Products engineers are packing and gasket specialists with complete fabricating facilities to meet your specific requirements. Write for our complete Teflon Packing and Gasket Catalog.

*du Pont Trademark

CHEMICAL & POWER PRODUCTS, INC.
The Original Fabricators of Teflon Packings and Gaskets

9 Broadway, New York 4, N. Y.

When inquiring check CP 3466 on handy form, pgs. 2-3

CORROSION

Cites typical advantages of ceramic coatings

Typical advantages of ceramic coatings and porcelain enamels, including corrosion-resistance and ability to withstand abrasion and high temperatures, are discussed in six-page bulletin. Charts are included which compare properties of coated and uncoated metals. Various applications of ceramic coatings and porcelain enamels are illustrated.

Bulletin on ceramic coatings and porcelain enamels is available from General Ceramics Corporation, Dept. CP, 25 Crow's Mill Rd., Keasbey, N. J. . . . or for more information reader may simply check CP 3467 on handy form, pages 2 and 3.

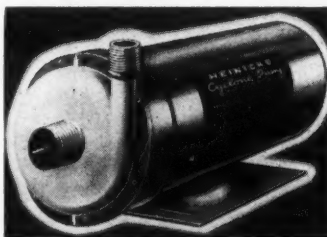
Mirror-smooth surfaces, die-formed impeller up pump efficiency . . .

centrifugal unit is made of
Type 316 stainless

Uses: Pumping corrosives or liquids containing solids.

Features: Made of mirror smooth Type 316 stainless steel with theoretically correct vane and shroud dimensions and curvatures, units operate at high efficiency levels. For example, a 3/4 hp model delivers 4260 gph at moderate pressures, and low heads.

Impeller of unit is die-formed rather than cast and mirror finish reduces friction and turbulence to a minimum. Cost of heavy-duty pumps is said to be in the price class of cast iron and bronze.



Stainless steel pump is in price class of iron and bronze units

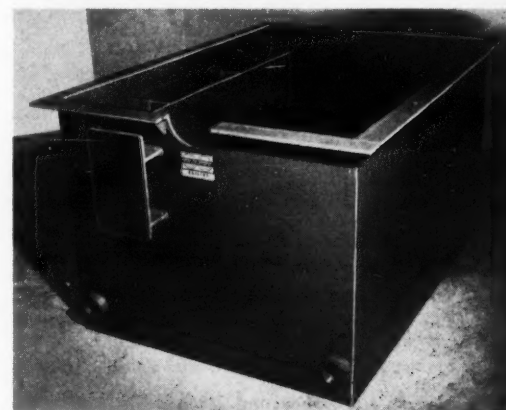
AGILENE (POLYETHYLENE) AGILIDE (NON-PLASTICIZED) (POLYVINYL CHLORIDE) "Barriers AGAINST CORROSION"

PLASTIC FABRICATIONS FOR THE CHEMICAL HANDLING INDUSTRIES

MODERN MATERIALS OF CONSTRUCTION



Agile's high-grade modern thermoplastic construction materials—AGILENE and AGILIDE—fabricated by a unique combination of forming and welding processes in which we specialize, are your safeguard for an economical and properly engineered installation.



Completely inert to the strong acid pickling solution contained, this 250 gallon AGILIDE self-supporting tank is fabricated from 1/2" plate, welded construction. Two sectional overflow compartments along with motor mounting base and threaded outlets allowed this tank to meet the customer's most exacting requirements to greatly reduce expensive maintenance costs.

American Agile Corporation

Plant and General Offices • 5461 Dunham Rd., Maple Heights, Ohio
Mailing Address: P. O. Box 158 • Bedford, Ohio

DEPT. C-1

When inquiring check CP 3468 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Description: All Cyclone stainless steel pumps are non-overloading, and equipped with self-flushing, non-corrosive mechanical seals. They are offered in $\frac{1}{2}$, $\frac{3}{4}$, and $1\frac{1}{2}$ hp models, in all standard voltages and cycles, single or three-phase.

(Stainless steel centrifugal pumps described in above story are products of Department HC, Heinicke Instruments, Department CP, 2035 Harding Street, Hollywood, Florida . . . or for more information reader may simply check CP 3469 on the convenient Reader Service slip located between pages 2 and 3.)

Corrosion inhibitors aid heat transfer

Film forming corrosion inhibitors which also aid heat transfer are the subject of technical paper. It contains many references to protection afforded by filming amines and attendant reduction in maintenance costs secured through protection against corrosion.

Filming amines function by forming a non-wettable film over metal surfaces contacted. Film acts as a barrier between metal and condensate, and since metal does not become wetted, corrosion is prevented even in presence of condensate containing large amounts of carbon dioxide and oxygen.

Case histories of typical applications of filming amines are cited in literature.

Technical Paper No. 129 is available from W. H. & L. D. Betz, Dept. CP, Gillingham & Worth Sts., Philadelphia 24, Pa. . . . or for more information reader may simply check CP 3470 on convenient Reader Service slip which is located between pages two and three.

For more information on product at right, specify CP 3471 . . . see information request blank between pages 2 - 3.

4

different types of
TRI-CLOVER fittings
used to solve specific
Corrosion-Resistant
piping problems for
ELI LILLY & COMPANY



Eli Lilly's modern, efficient pharmaceutical plant at Indianapolis serves as an excellent example of the way in which some of the many types of Tri-Clover Stainless Steel Fittings are utilized to solve specific corrosion-resistant liquid conveying line problems.

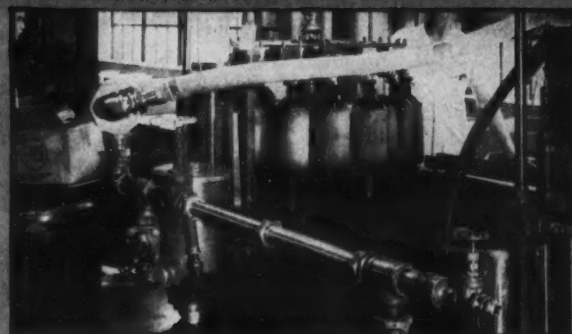
With Tri-Clover and Eli Lilly engineers working together, the most efficient, economical type of fitting and line assembly was determined to meet each individual process requirement.

With a complete line of all types of highest quality stainless steel fittings, valves, pumps and tubing, plus experienced engineering service, Tri-Clover is extremely well qualified to help you solve your corrosion-resistant piping problems.

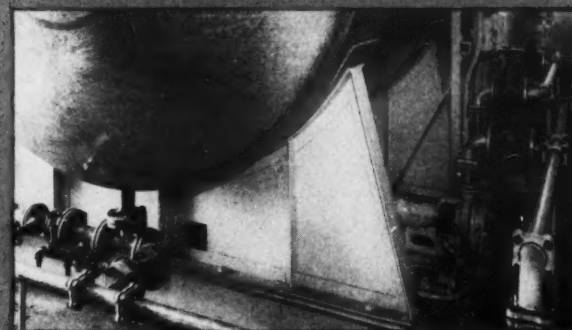
Call or write for further details.

See your nearest
TRI-CLOVER DISTRIBUTOR

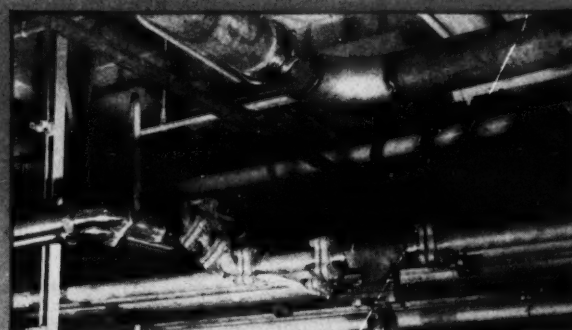
LADISH CO.
Tri-Clover Division
KENOSHA WISCONSIN



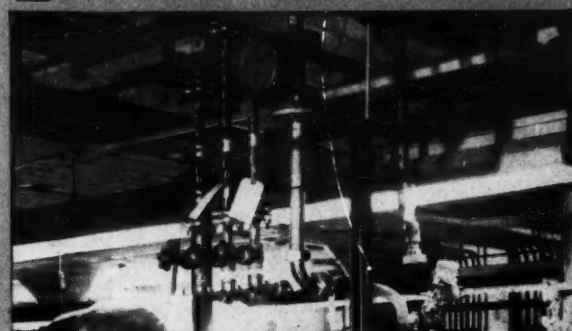
1 Polished sanitary type stainless steel fittings are used here in liquid transfer lines to a filling machine.



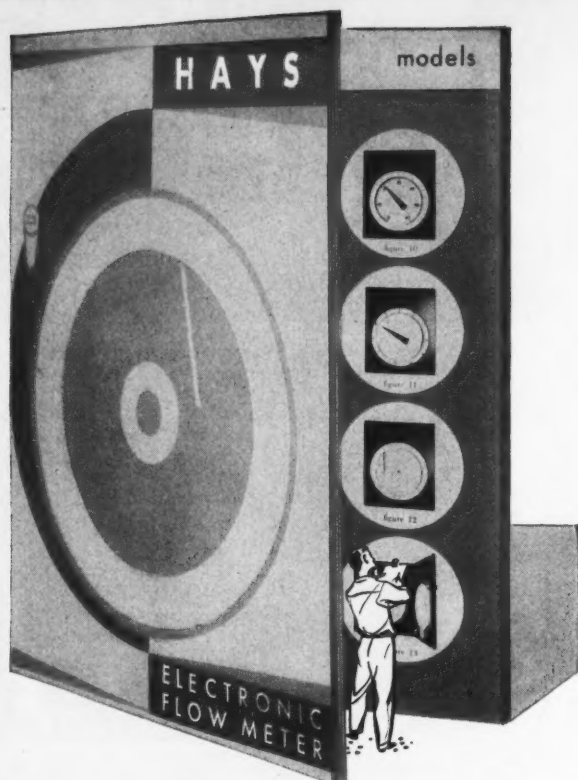
2 Tri-Clover stainless steel conical end fittings are used here in processing Pyrogen-free distilled water.



3 View shows Tri-Clover conical end, sanitary, industrial welding and Tri-Crimp fittings utilized in several different liquid transfer lines.



4 Here are liquid conveying lines to filling machines, utilizing Tri-Clover conical end, sanitary, and I.P.S. screwed stainless steel fittings.



a guide to better flow metering

Here's a new fact-filled, technical booklet that tells you feature for feature how the new Hays electronic flow meter excels.

Electronic operation—provides maximum accuracy ($\frac{1}{4}\%$ of full scale differential), and speed (4 seconds for full scale pen travel).

Mercuryless transmitters—rupture-proof metallic bellows for differential pressure measurement.

Continuous integration—motor-driven, continuous mechanical integrator is extremely accurate even on rapid load changes.

Other features include powerful motor, easy readability, accuracy unaffected by normal temperature changes, optional explosion and weather-proof transmitter.

Write now for bulletin 54-1074-222 and get the important facts.

Automatic Combustion Control
Boiler Panels • CO₂ Recorders
Variable Meters and Veritrol
Gas Analyzers • Draft Gages
Combustion Test Sets
Electronic Oxygen Recorders
Electronic Flowmeters
Electronic Feed Water Controls
Miniature Remote Indicators

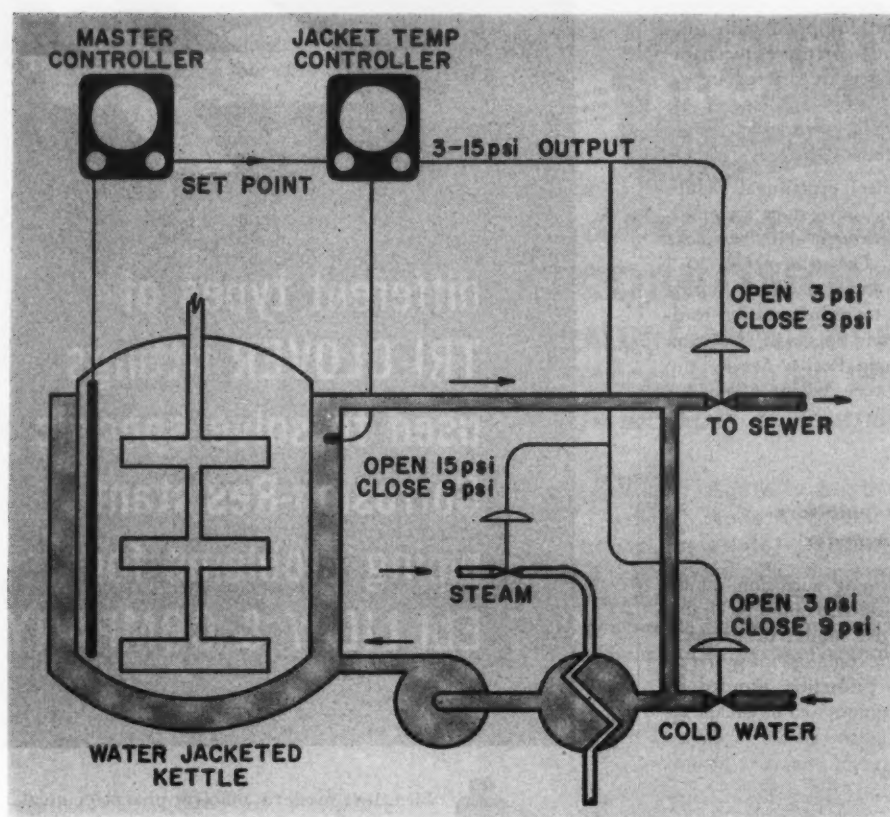
hays

CORPORATION

MICHIGAN CITY, INDIANA

When inquiring check CP 3472 on handy form, pgs. 2-3

instrumentation & control



Cascade control without reset can

hold polymerizer temperature steady

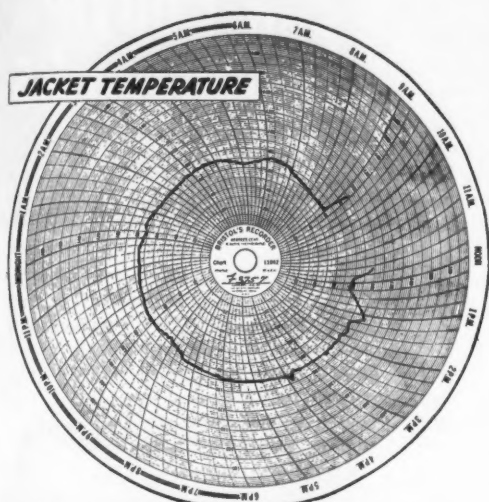
Measurement of batch temperature controls setpoint for jacket temperature; cold water and steam are fed to jacket. Net result: only 2°C overshoot when polymerization goes exothermic

Since polymerization requires heat to get started, then becomes exothermic, its control is often problematical. Because of this changeable nature, the reaction was originally started up manually. Reset action controllers were tried, but because velocity of the polymerization reaction increases greatly with a small temperature rise above the setpoint, reset controllers are unsatisfactory during automatic startup. Overshoot nearly always occurred and reaction ran

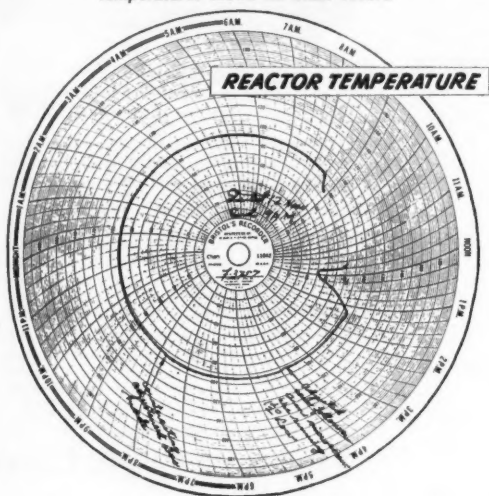
away and became uncontrollable in the process. Several installations of cascade control have been made in this process. General scheme is shown in the diagram. Master controller of the cascaded control system is a recording temperature-program controller. A transparent plastic cam mounted over chart is rotated by chart shaft drive. Temperature sensing element for the master controller is a long (108") tube which measures temperature of the batch from top to bottom.

Output air from the master controller changes setpoint of the jacket temperature controller. This is a direct acting proportional controller.

Output air from the jacket temperature controller positions three control valves. Steam control valve is normally closed (air-to-open) type which fails safe by shutting off steam if there is an air failure. Cold



Jacket temperatures were recorded by the jacket temperature controller and resulted in smooth reactor temperatures shown on other record



water valve and outlet valves are normally open valves which close when control pressure reaches 9 psi. Steam valve closes at 9 psi and runs wide open at 15 psi.

In starting up, reverse-acting controller produces 15 psi output, opening steam valve to supply heat to the exchanger. Open water supply and outlet valves are closed so that water in the jacket is recirculated by pump.

Passage of steam through heat exchanger brings operating temperature of the jacket up to setpoint. "Autoset" range (span through which setpoint can be automatically positioned) of the jacket temperature controller is manually adjusted with limits of 40 and 110°C. As water jacket approaches 110°C, output of the water jacket temperature controller falls.

(Continued on next page)

Now

**SINGLE
SEAT VALVES
FOR
Large Flow Rates
WITH
ANNIN'S
BLUNYAN
SERIES
DOMOTOR VALVES**

Body Sizes ... 6"-8"-10"

Body Design ... Globe, angle and 3-way. Tight shut-off, single-seat body. Standard, Cooling Fin or Doolseal bonnet.

Body Ratings ... Standard ASA 300, 600, 900, 1500, and 2500 PSI.

Operators ... Domotor, cylinder and handwheel. Domotor operators for all pressures and pressure drops. Piston sizes of 200 and 400 sq. in. for thrusts up to 40,000 lbs. Domotor or Cylinder strokes to 6" as required.

You'll profit by learning more about the superior features and better performance of Annin Control Valves.

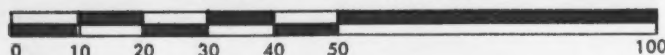
THE ANNIN COMPANY
Dept. CP, 6570 East Telegraph Road, Los Angeles 22, Calif.

ANNIN

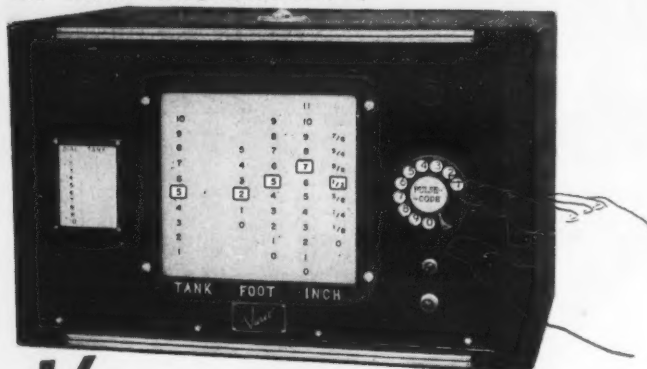
Control VALVES

When inquiring check CP 3473 on handy form, pgs. 2-3

SCALE OF MILES



... accurate liquid level gauging-
at ANY DISTANCE!



"Varec" PULSE CODE TELEMETERING SYSTEM (PATENTS APPLIED FOR)

THE VAPOR RECOVERY SYSTEMS COMPANY has successfully eliminated the one great drawback to accurate transmission of remote tank gauging over long distances — *loss or gain of a part of the signal.*

Through use of the pulse code method of message transmission the system utilizes a separate pre-arranged code for each $\frac{1}{8}$ " increment of measurement.

At the receiver, the code transmitted by the tank unit is translated into the equivalent measurements — there can be no borderline cases where the reading might fall between two increments. The receiver will either produce the *correct* reading as transmitted or it will not produce any reading.

Obviously such an exact system is not confined to liquid level telemetering alone. It can be readily applied to numerous supervisory control problems such as remote control of pump motors, control valves and associated equipment. Thus the complete dispatching operation, gauging and remote control is integrated into one single unitized system when a "Varec" Pulse Code Telemetry System is installed.

The equipment is also capable of providing tank liquid level alarms or warnings of any off-normal conditions at the remote control point. Further, the receiver readings may be fed into automatic printing equipment for a permanent record and automatic sequencing equipment may be added to provide fully automatic tank gauging.

Before you install any type of remote gauging we urge you to thoroughly investigate the "Varec" Pulse Code Telemetry System — write today for complete details.



THE VAPOR RECOVERY SYSTEMS CO.
COMPTON, CALIFORNIA
Cable Address: VAREC COMPTON
Calif., (U.S.A.) All Codes

961-2

When inquiring check CP 3474 on handy form, pgs. 2-3

INSTRUMENTATION

(Continued from preceding page)

When it reaches 9 psi, steam valve closes completely and water inlet and outlet valves begin to open. Cold water is now introduced and part of heated water of the jacket is drained off.

As can be seen in control charts, (at about 1:00 PM) temperature of batch in the reactor has reached its setpoint of 95°C. At this point output of the master controller brings jacket temperature controller setpoint down from upper limit and control action begins to reduce jacket temperature rapidly.

This is the period in which polymerization is entering the exothermic stage. Function of the jacket now becomes that of cooling the reactor.

Because of this sudden change from supplying heat to cooling, derivative action of the master controller becomes very effective. Note that reactants were brought from a temperature of 50 to 95°C in about 90 minutes. Despite this steep temperature rise, and the tendency of polymeric reactions to run away, temperature overshoot was less than 2 degrees.

(Design of this control system and the Autoset Temperature Controller were engineered by the Bristol Company, Dept. CP, 143 Bristol Rd., Waterbury 20, Connecticut . . . or for more information reader may simply check CP 3475 on handy form, pages 2 and 3.)

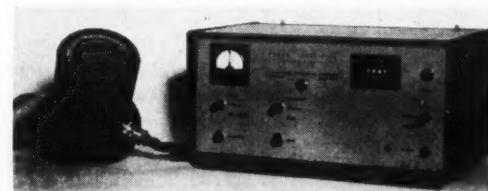
Accurately measure pressures in field or lab work with balance . . .

digital readout counter on unit eliminates lag

Uses: Provides laboratory standard for precise calibration of pressure pickups or for use in sensing pressure in inaccessible locations.

Features: Visual digital readout counter with digits to 1000 makes immediate readings possible. Instrument is so designed that readings may be held when required or attached to electrical tabulating devices through built-in electrical analog DC output of 10 volts.

Description: Pressure pickup has three possible readings — differential, gage, and absolute pressure. Entire pressure balance system operates on principle of dynamic force-balance. Amplifier may



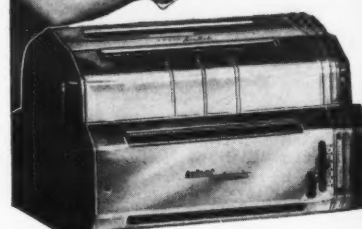
Pressure balance provides laboratory standard for calibration of pressure pickups

With Revolutionary Machine . . .

End Copying Bottlenecks Automatically



A Low Cost Complete
Photocopy Department
All In One
20 inch Unit



All Electrical
No Installation
APECO Auto-Stat
SYSTEMATIC

Right in Your Own Office Photocopy Anything Written, Printed, Typed, Drawn or Photographed in Less than 45 Seconds

Solve the problem of handling your paper work in a hurry with the new Apeco Systematic Auto-Stat. With this quick copying machine, thousands of firms have eliminated 35% of all typing and actually cut paper work in half. Anyone can operate it . . . just flip a switch and any papers, opaque or transparent, can be copied in seconds no matter if printed on one or two sides. It's low cost, too . . . priced within the budget of the smallest business.

Lifetime Service Guarantee with
Every Apeco Auto-Stat

Send for NEW FREE Book



American Photocopy Equipment Co.

1914 W. Peterson Ave., Chicago 26, Ill.

Rush me without obligation your new book the "Auto-Stat Story." I understand this is a report on Auto-Stat copying and shows how this machine can increase the efficiency of any business.

NAME _____
FIRM _____
ADDRESS _____
CITY _____ STATE _____

In Canada: APECO OF CANADA, LTD., 124 Park Lawn Road, Toronto, Ont.

When inquiring check CP 3476
on handy form, pgs. 2-3

CHEMICAL PROCESSING

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be used with various ranges of pressure sensing pickups. Cable (10' long) enables readings to be taken remotely from amplifier.

(Type 37-103 Pressure Balances are a product of Consolidated Engineering Corp., Dept. CP, 300 N. Sierra Madre Villa, Pasadena 8, Calif. . . . or for more information reader may simply check CP 3477 on the convenient Reader Service slip which is located between pages 2 and 3.)

Contents of pipeline revealed quickly and accurately . . .

controls crude oil purity in pipelines by detecting bottom sediment and water in raw crude

Instrument has been developed by Gulf Oil which offers a continuous check on pipeline contents. It functions by revealing variation in electrical properties of the fluid as it passes between two electrodes fixed within the pipe. Changes are recorded on a clock-driven chart.

Device is highly sensitive. It can differentiate between two batches of a product of similar specifications, such as a grade of gasoline from two different sources, as they pass through line.

In recent tests, five types of gasoline, a kerosene and a No. 2 fuel were sent through a pipeline. Standard procedure of dispatcher and checkers employing color tests, hydrometers and gravimeters was used to check contents. Using newly developed instrument, same pipeline contents were checked faster and more accurately than with standard procedure.

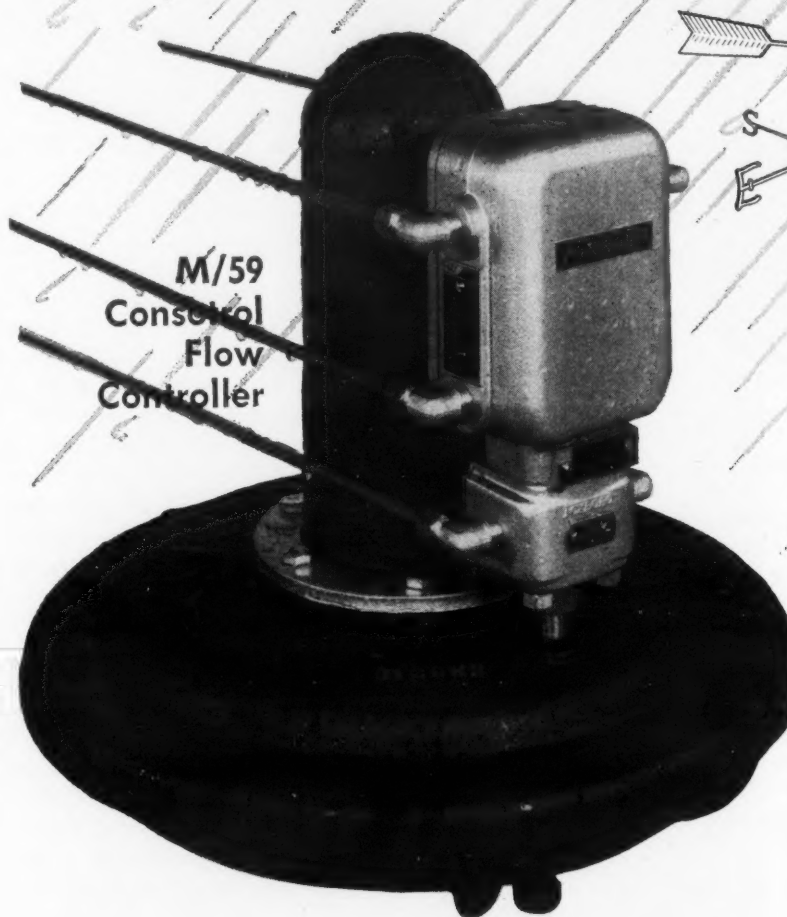
Instrument helps crude oil purchasers avoid paying for sediment and water by accurately determining amount of bottom sediment and water present in raw crude. This running check in line, is expected to help eliminate tankage now used to check crude purity.

(Capacitance Recorder will be manufactured under license from Gulf, by Instruments, Inc., Department CP, 122 North Madison, Tulsa 6, Oklahoma . . . or for more information about this product reader may simply check CP 3478 on the convenient Reader Service slip which is located between pages two and three.)

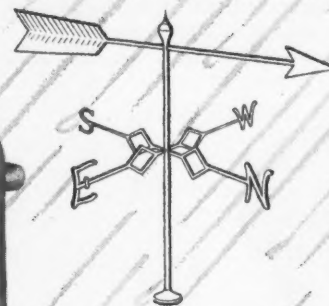
Need instrumentation for that process?

You'll find just what you need in the alphabetized, itemized Product Directory on pages 213 to 216. All subjects and products presented in ads and editorial columns are there.

This Controller requires no more attention than a weathervane!



M/59
Consotrol
Flow
Controller



Like a weathervane, the Foxboro M/59 Consotrol Controller can be installed completely exposed to the elements . . . and forgotten about! Unsurpassed in performance by any other flow controller, the M/59 is completely indifferent to weather conditions.

This rugged Flow Controller mounts directly on the air connection of the valve . . . at a fraction of usual installation cost. Its case is tightly gasketed, continuously purged, completely weatherproof, highly resistant to dust, fumes, and vibration. There's nothing to align, nothing to wear out. A flexure-strip fulcrum eliminates the friction and wear of conventional pivots . . . eliminates "conventional" maintenance.

In operation, the M/59 fully utilizes the speed and sensitivity of the Foxboro d/p Cell Flow Transmitter . . . does away with transmission lag . . . gives fastest recovery from process upsets. For the complete story, write today for Bulletin 470.

"Live-Balance" Control on any fluid with any size valve motor.

Lowest first cost. Lowest installed cost.

Lowest maintenance cost.

Unique Simplicity — exclusive design permits fixed, optimum proportioning and reset values for liquid flows. Adjustable reset optional for gas or steam flow.

THE FOXBORO COMPANY, 8111 NEPONSET AVENUE, FOXBORO, MASS., U.S.A.

FOXBORO

REG. U. S. PAT. OFF.

FLUID FLOW CONTROLLERS

FACTORIES IN THE UNITED STATES, CANADA AND ENGLAND

When inquiring check CP 3479 on handy form, pgs. 2-3

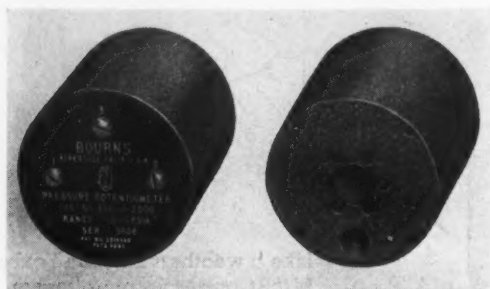
INSTRUMENTATION

Durable pressure transmitter withstands extreme shock and vibrations . . .

unit provides accuracy to within $\pm 1\%$ under
50 g linear acceleration

Uses: For measuring altitude, fuel pressure,
throat and static pressure in aircraft, missile, and
industrial applications.

Features: Rugged potentiometer withstands 50 g
longitudinal acceleration with error of less than
1%. Electrical output of 0.5 w requires no am-



Units weigh 7 oz and are 2 1/4" diameter by 2 3/8" long

plification and may be fed directly into telemetering
transmitters, recorders, etc.

Description: Performance characteristics in-
clude resolution of 0.25 to 0.50% for resistances
from 1000 to 10,000 ohms. Optimum linearity and
repeatability with minimum hysteresis and tem-
perature error result from beryllium copper dia-
phragm bellows.

Units weigh 7 oz and are 2 1/4" diameter by 2 3/8"
long. Power rating is 0.5 w at 160°F. Typical pres-
sure ranges: 0-2; 0-4; 0-8; 0-11; 0-15; 0-20; 0-30;
5-10 and 3-14.7 psia. Standard resistance values of
1000, 2000, 5000 and 10,000 ohms are provided.
(Mod 408 Absolute Pressure Potentiometers are a
product of Bourns Laboratories, Dept. CP, 6135
Magnolia Ave., Riverside, Calif. . . . or for more
information reader may simply check CP 3480 on
handy form, pages 2 and 3.)

Describes, pictures microscope for fiber inspection

Illustrated bulletin describes unit which gives
magnifications from 75 to 500X and projects
image on 8" ground glass screen. Apparatus is
designed specifically for inspection of surface
structure and surface quality of textile fibers.

Bul on "Fibroscope" is issued by William J.
Hacker & Co., Inc., Dept. CP, 82 Beaver St.,
New York 5, N.Y. When inquiring specify CP
3481 on handy form, pages 2 and 3.

in selecting a **Pneumatic Controller**

check these important considerations

Versatility

The variety of control types available in the
basic instrument may reduce initial invest-
ment and subsequent cost of instrumenting
process changes. For example, the basic in-
strument may be used without modification
for proportional control, differential-gap
control, on-off control and pneumatic trans-
mission; with substitution of one unit sub-
assembly, for proportional-reset control;
and, with addition of the appropriate unit
subassembly, for pneumatic-set, time-pro-
gram or differential control.

Simplicity

Minimizing linkage and use of simplified air
circuits and unit subassemblies eliminates in-
herent trouble spots and lost motion, im-
proves sensitivity and operation, facilitates
servicing, adjustment and start-up. Ease of
adjustment, setting and reversibility of con-
trol action assists operator in tuning in.

Economy

Low initial investment and minimum change-
over costs are basic economies. Additional
savings are made possible through minimum
service requirements and the ease and speed
of maintenance, because of simplicity of
design.

Dependability

Where complications are "designed out" de-
pendability is built in. An excellent per-
formance record in a wide variety of appli-
cations attests the soundness of the design.

Among controllers of its type, the Masoneilan
60000 Series Controller is outstanding be-
cause it offers greater value — greater
simplicity, versatility and economy and un-
surpassed performance. Investigate its ad-
vantages — ask for complete information —
and a demonstration in your own plant.

Complete data on request — write

The Choice
Where Quality
of Product
Depends on Quality
of Equipment.

MASON-NEILAN REGULATOR CO.
1203 Adams St., Boston 24, Mass., U.S.A.

MASONEILAN

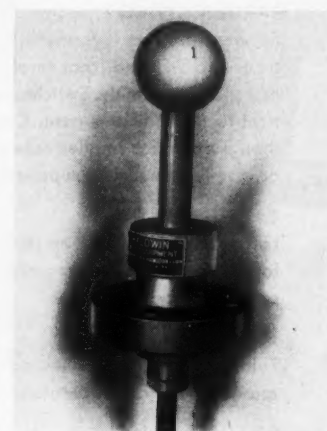
**Wind's force and direction
measured electrically
with SR-4 . . .**

gives instantaneous response to sudden changes

Uses: For electrically measuring wind's force and direction.

Features: Lightweight 2-inch diameter hollow metal ball provides instantaneous response to sudden changes or shock waves.

Description: Pick-up unit is essentially a cylindrical cantilever beam on which there are two independent Wheatstone bridge circuits. These consist of resistance wire strains gages arranged to



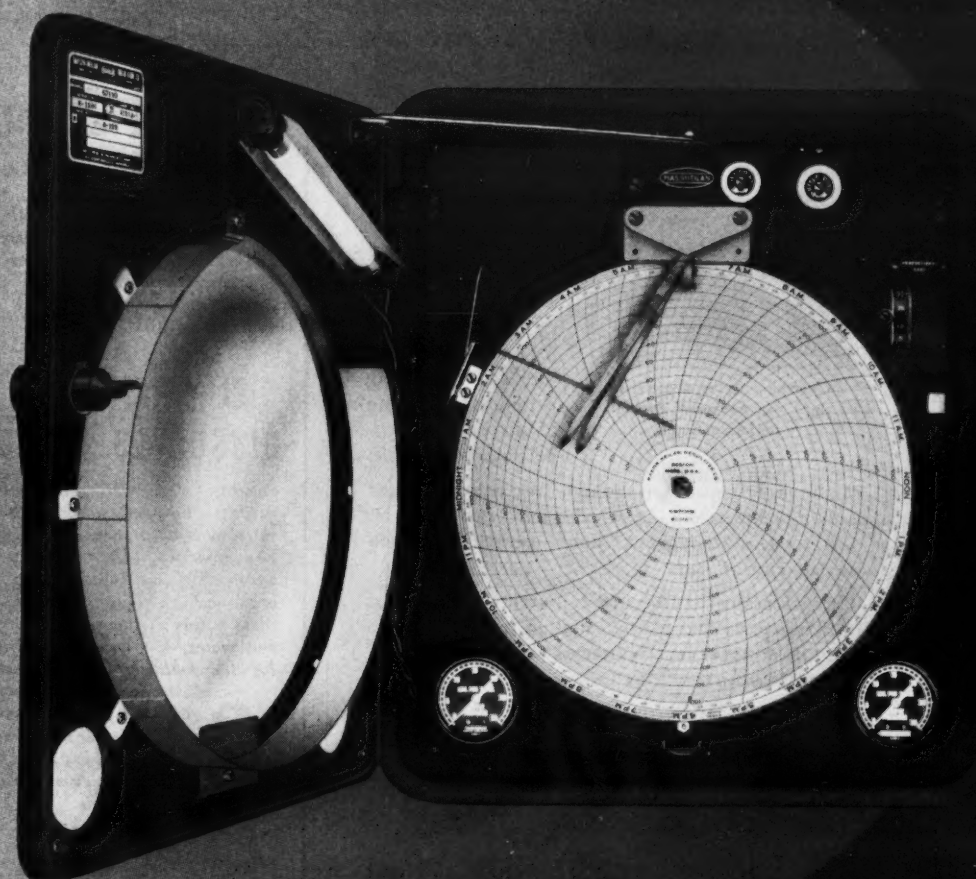
Gives instant response to sudden wind changes or shock waves

measure the strains caused by wind forces in two directions at right angle to each other.

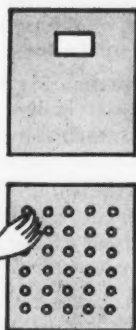
Combination of these bending strains provides a means of indicating both magnitude and direction of air flow by means of simple electronic amplifier circuits and indicating and recording instruments.

(SR-4 Wind Sensing Unit is a product of the Baldwin-Lima-Hamilton Corp., Dept. CP, 940 Simpson St., Eddystone 42, Pa. Check CP 3482, pages 2 and 3.)

For more information on product at left, specify CP 3483 . . . see information request blank between pages 2-3.



WHY SHOULD I USE T-E'S SELF-BALANCING INDICATOR?



**TO READ A
LOT OF
TEMPERATURES
QUICKLY AND
ACCURATELY.**

LARGE CAPACITY

Several hundred thermocouples or resistance bulbs can be connected to T-E's indicator through toggle switches, rotary switches, or connector panels. Switches are housed in a separate case identical to the indicator case. Capacity is 50 to 160 points. For less than 50 points a smaller case can be used, for over 160 points, 2 or more cases can be supplied.

EASY-TO-READ

Large, 34" scale has from 400 to 600 widely spaced graduations for accurate and easy reading. Hairline is close to dial, minimizes errors from parallax.

SPEEDY

Full scale travel only 4 seconds. Balances rapidly at temperature value.

23 SCALE RANGES

From -320° to +200°F all the way up to 0° to 3000°F.

ACCURATE

± 1/4 of 1% of scale range.

SENSITIVE

1/20 of 1% of scale range.

DURABLE

Simple design keeps maintenance low and instrument life long. Only 2 moving parts, the motor and the shaft carrying dial, slide-wire, and drive gear. Slidewire is enclosed to protect it from dust or electrical interference.



Interested? Write for bulletin 61-R.

Pyrometers • Thermocouples • Protection Tubes • Quick-Coupling Connectors
Thermocouple and Extension Wires • Resistance Bulbs • Connector Panels

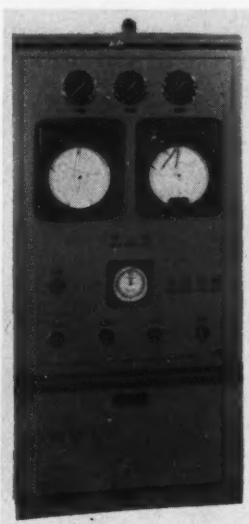
Thermo Electric Co., Inc.
SADDLE RIVER TOWNSHIP, ROCHELLE PARK POST OFFICE, NEW JERSEY
IN CANADA—THERMO ELECTRIC (Canada) Ltd., BRAMPTON, ONTARIO

When inquiring check CP 3484 on handy form, pgs. 2-3

INSTRUMENTATION

**Controls temperature rate-of-rise
and holding period temps
during process . . .**

controller has uses in dyeing, starch sizing, and other time-temperature operations



Controller is mounted on
right in package dyeing
control cabinet

Amber light remains on through "rise period". When holding temperature is reached, green lamp comes on and remains throughout "hold" period. Red light signals end of cycle.

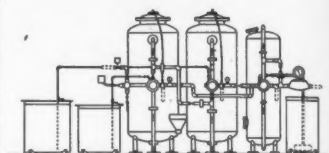
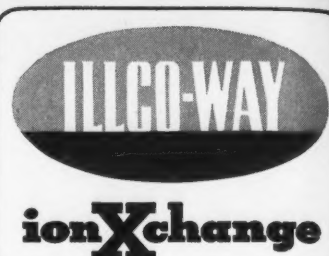
Internal heater in instrument prevents corrosion of working parts due to condensation or corrosive vapors. Instrument has continuous chart rotation, providing 24 hour records.

(Model 40 C-H CycleLog Controller is a product of The Foxboro Co., Dept. CP, 174 Neponset Ave., Foxboro, Mass. Check CP 3485, pages 2 and 3.)

Compiles papers and charts on spectrographic analysis

Papers presented at 56th Annual Meeting of American Society for Testing Materials symposium on emission spectroscopy are compiled in 72-page 6 x 9 heavy-paper bound booklet. Pictures, graphs, charts, tables, and schematic diagrams on fluorescent X-ray spectrographic analysis are included.

Tech Pub STP 157 may be obtained by remitting \$1.75 direct to American Society for Testing Materials, Dept. CP, 1916 Race St., Philadelphia 3, Pa.

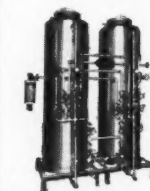


GET H₂O ONLY

In those processes where chemically-pure water is desired, the most economical way to obtain it is often by de-ionization. Current ionXchange practice provides an effluent which is chemically the equivalent of that obtained by multiple distillation.

ELIMINATE ALL DISSOLVED SOLIDS

Starting with water containing various dissolved solids such as calcium sulfate, magnesium carbonate, silica, etc., one form or another of ionXchange can be employed to eliminate ALL of these solids in the resultant purified water. *We have been designing and building practical equipment to accomplish such results ever since the enabling resins first became available.* Tell us your needs, and let us see what we can do . . .



ILLINOIS WATER TREATMENT CO.
ionXchange



903 CEDAR ST.
ROCKFORD,
ILLINOIS

NEW YORK OFFICE: 141 E. 44TH ST., NEW YORK 17, N. Y.
CANADIAN DIST. PUMPS & SOFTENERS, LTD. LONDON, ONT.

When inquiring check CP 3486
on handy form, pgs. 2-3

CHEMICAL PROCESSING

INSTRUMENTATION

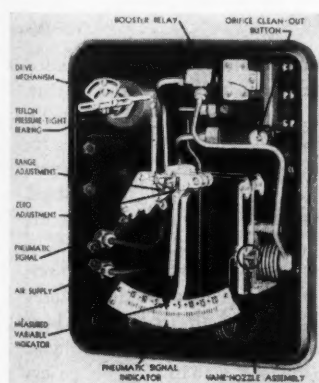
**Transmits air signal
as far as 1000 ft
to receiver . . .**

unit measures flow, level,
temperature or pressure

Uses: As a primary element
in pneumatic telemetering and
control systems, unit transmits
measurements of flow, level, pres-
sure, temperature, draft, differ-
ential, and vacuum.

Features: Accuracy is within
 $\frac{1}{2}\%$ of measured range span. Air
consumption is 0.15 cfm.

Description: Measuring ele-
ment actuates transmitter's micro-
sensitive vane, nozzle, and booster
assembly. Transmitted signals of
3-15 and 3-27 psig operate pneu-
matic receivers or controllers.



Transmits signals of 3-15 or 3-27
psig to actuate pneumatic re-
ceivers or controllers

Both measured variable and pneu-
matic signal are indicated on com-
mon scale for easy checking. Unit
transmits signal up to 1000 ft
to receiver or 400 ft to control-
lers. Capacity is approximately 3
cfm with drop of 1 psig from 15
psig signal.

(Universal Pneumatic Transmitter is a product of Bailey Meter Co., Dept. CP, 1050 Ivanhoe Rd., Cleveland 10, Ohio. Check CP 3487, pages 2 and 3.)

For more information on prod-
uct at right, specify CP 3488
... see information request
blank between pages 2 - 3.

Would an Operating Medium Failure

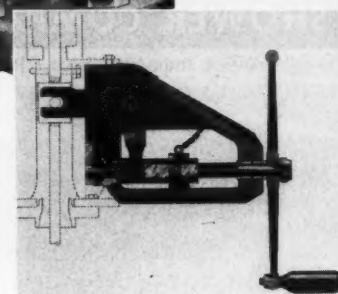
SHUT YOU DOWN?

Not if you have this BS&B MANUAL CONTROL!



If the diaphragm control valves in your plant were suddenly rendered inoperative by failure of the operating medium, (or in rare instances by diaphragm failure within the valve), would you be forced to shut down immediately while repairs were made? Not if your valves are equipped with the BS&B Type Y Continuously Connected Side Handwheel for emergency manual control!

The Type Y is especially designed for use with all BS&B Diaphragm Control Valves, including Types 15 and 86, and the pressure balanced Type 73, where no by-pass is provided around the valve. It has a cast iron frame which fits onto the various Climax Valve Yokes. Working parts are of stainless steel, and it is equipped with an Ampcoloy jack screw, "Oilite" bearings and a large handwheel for ease of operation.



With the Type Y, control valves can be manually positioned in either direction independently of the normal controlling impulses. Its mechanism provides stops so that travel can be set to cover any portion of the complete valve stroke.

Avoid costly shut-downs due to operating medium or diaphragm failure! You can keep your plant operating indefinitely on an emergency basis if your control valves are equipped with the BS&B Type Y Continuously Connected Side Handwheel!

For complete information on any BS&B Climax Control or accessory, ask your BS&B Man, or write to . . .



BLACK, SIVALLS & BRYSON, INC.
CLIMAX CONTROLS DIVISION, DEPT. 4-M11
7500 East 12th Street
Kansas City 26, Missouri

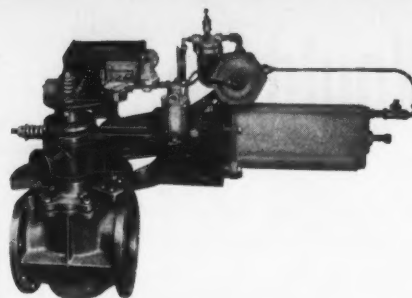
LOOK TO DeZURIK FOR

AUTOMATIC CONTROL VALVES

DeZurik Easy-Operating Plug Valves equipped with positioning type air and hydraulic operators represent the finest in automatic valving. They handle *anything* from gases to slurries and operate with top efficiency, *even on high vacuum services!*

The exclusive eccentric principle permits DeZurik Automatic Control Valves to deliver drip-tight shut-off with automatic operation because they're FRICTION-FREE; they require *no lubrication* — minimum maintenance!

Write for complete details and service recommendations.



DeZurik Automatic Control Valves feature:

- excellent control characteristics
- straight-thru flow
- sizes from 1/2" thru 20"
- all castable metals

AND they're attractively priced!

DEZURIK SHOWER COMPANY — SARTELL, MINNESOTA

When inquiring check CP 3489 on handy form, pgs. 2-3

*Thank modern electronics
for this:*

**A full-fledged line-operated
pH Meter of remarkable accuracy
at the UNPRECEDENTED price of**

\$115⁰⁰

**... made possible by recent
advances in electronic tubes and
circuits.**

Write for Bulletin #225 to

PHOTOVOLT CORPORATION
95 MADISON AVENUE • NEW YORK 16, N. Y.

PHOTOVOLT pH METER MOD. 115



- SIMPLE in operation and maintenance.
- FAST and dependable in daily service.
- FULLY stabilized for wide range of line voltage fluctuations.

When inquiring check CP 3490 on handy form, pgs. 2-3

INSTRUMENTATION

**Uses compressed air to signal
right or left corrections
of paper web edge . . .**

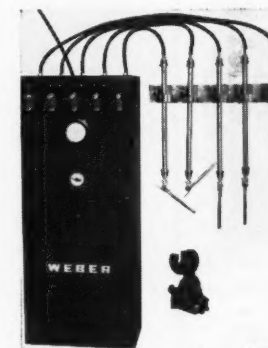
detects alignment changes down to 0.0001 inch

Uses: To remotely control the alignment of unruly paper webs in multi-wall tuber, laminating, corrugating, and other paper converting operations.

Features: Remote control edge alignment system uses low pressure air jet to sense alignment changes as small as 0.0001 inch with fast response speed (0.2 sec). Sensing device can be located as far away as 100 ft from control cabinet.

Description: Web edge sensing device operates from metered and controlled flow of air admitted to a closed air circuit. Circuit dead ends against two diaphragm pressure switches and escapes through sensing nozzle. Pressure switches are sensitive to pressures as low as 1/4" of water. For web edge detecting, one switch is set to operate at 1/2" water and the other is set for 3/4". First pressure switch (1/2") is normally closed; other is normally open.

When air jet from sensing nozzle is undisturbed by web edge, back pressure is less than 1/2" and normally closed switch remains closed, energizing roll stand adjustment motor. Motor continues to move roll stand until web edge disturbs air jet, causing back pressure of more than 1/2" but less than 3/4" (web in neutral position splitting air jet). At this stage, both switches are open. When web drifts across jet, back pressure then exceeds 3/4" of water. Switch closes energizing motor in reverse until web has been taken back to neutral position, splitting air jet.



Unit controls five unwinding roll stands, making right and left alignment corrections

As sensing device calls for correction to right or left, it transmits corresponding electrical signal to electronic timer through web "run-in" switch. If the "run-in" (footage measuring) switch has not accepted the previous signal and made the resulting correction, it refuses signal until previous signal has "run-in". If the previous signal and correction does not bring web back to neutral, additional signal from sensing device is accepted and its correction made.

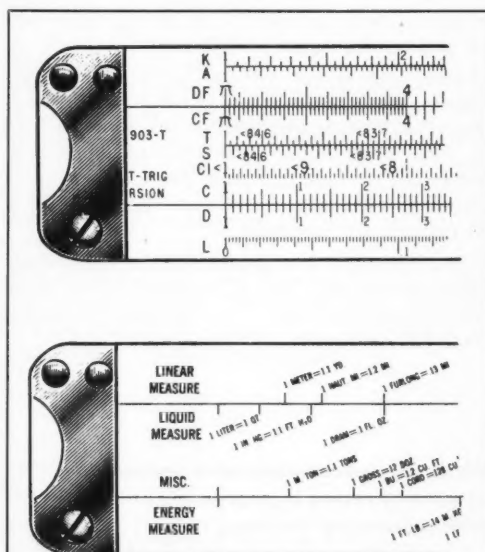
Electronic timer, upon receiving signal from web

edge sensing device as allowed by "run-in" switch, energizes roll unwind stand alignment motor for given time interval. Motor shifts roll stand to right or left.

Electronic timer is adjustable from 0 to 5 seconds to permit edge alignment steps to be controlled to any desired increments. For example, $\frac{1}{2}$ second edge alignment motor running time may equal $\frac{1}{16}$ " edge alignment steps; 1 second running time equals $\frac{1}{8}$ "; $1\frac{1}{2}$ seconds running time equals $\frac{3}{16}$ inch, etc. In case of badly telescoped roll, operator may change electronic timer setting to allow adjustment increments of $\frac{1}{8}$ inch or $\frac{3}{16}$ inch to assure that rate of correction will exceed rate of run out on roll.

Number of webs and unwind stands which can be controlled by electronic remote control edge alignment unit is unlimited. Units can be manufactured to accept any number of sensing nozzles.

(Electronic remote control edge alignment units are products of H. G. Weber & Co., Inc., Dept. CP, Kiel, Wisconsin . . . or for more information reader may simply check CP 3491 on the convenient Reader Service slip which is located between pages two and three.)



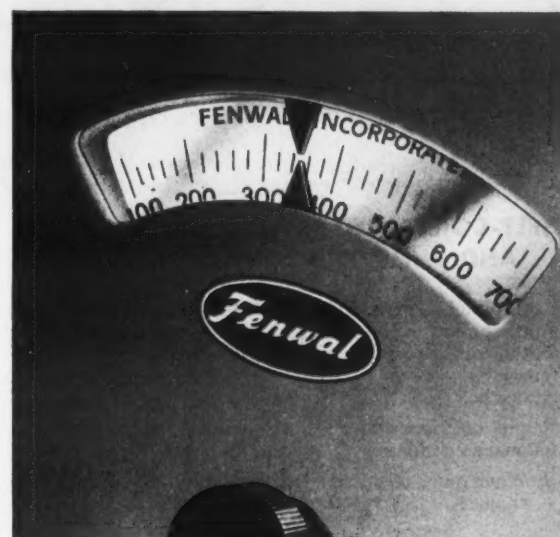
Conversion slide rule makes reference to tables of equivalents unnecessary. With single setting, rule automatically makes conversions without computation. Rule has 64 linear, liquid, energy, and other factors on one side plus complete trig scale (A, K, DF-CF, T, S, CI, C-D, and L scales) on reverse.

Mod 903-T single-setting conversion rule is a product of Pickett & Eckel, Inc., Dept. CP, 1109 S. Fremont St., Alhambra, Calif. . . . or for more information check CP 3492 on handy form, pages 2 and 3.

Now . . . a new Temperature Indicator-Controller by Fenwal



1. FENWAL'S NEW SERIES 540 is a remote Temperature Indicator-Controller that combines low cost with high accuracy over a temperature range of 100° to 700°F. Designed for ovens, packaging and processing equipment of all types, the new controller operates on a liquid-filled bulb and capillary system whose response to temperature changes is transmitted through a bellows to an indicating pointer. It may be flush-mounted or surface-mounted.



2. "SET" AND "CHECK" ARE EASY. Temperature setting pointer and bulb temperature pointer pivot on the same axis, indicating against the same scale face. This permits "glance" comparison of actual and set-point readings at considerable distance from the dial. An adjustable differential, variable between 0.8% and 4% of scale range, permits adjusting the operating bandwidth to balance closeness of control against slower cycling and longer equipment life.



3. ACCURACY IS ASSURED. Temperature indication is accurate to within 3% over the 100° to 700°F range, including the effects of ambient temperature in the range of 50° to 150°F. Accuracy increases for narrower ranges. Uniform control and accurate calibration are maintained with typical Fenwal precision in this new, popular-priced addition to a famous line of temperature control and detection devices.



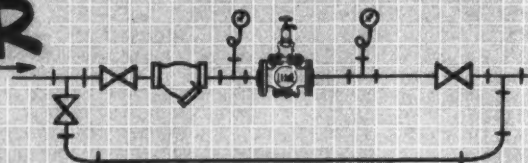
4. SEND FOR NEW BULLETIN. Get all the facts on how closely the new Series 540 meets your requirements for an economical, accurate indicator-controller. Write for comprehensive bulletin MC122. And remember, we're always ready to help in any problems concerning temperature control and detection. Fenwal Incorporated, 2411 Pleasant Street, Ashland, Mass.

Fenwal

Controls Temperatures
... Precisely

When inquiring check CP 3493 on handy form, pgs. 2-3

WHEN TO USE A REGULATOR

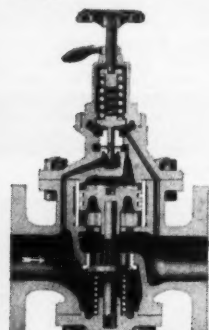


SELF-CONTAINED PRESSURE, TEMPERATURE AND PUMP PRESSURE REGULATORS

Leslie Self-Contained Regulators are spring loaded, internal pilot, piston or diaphragm operated with stellite seating surfaces, hardened stainless steel main valves and renewable wearing parts of heat treated stainless steel of grades best suited to the application.

Regulators are used for any one or any combination of the following conditions:

- ★ When quick response is necessary to handle sudden load changes.

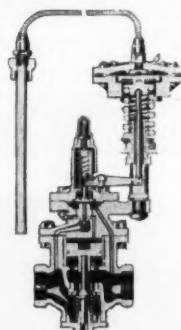


Pressure Reducing Valve
Class L-3

LESLIE PRESSURE REDUCING VALVES

Automatically maintain a constant reduced pressure of steam, air or gas. Single seated, tight closing. Respond instantly to load changes. Renewable, interchangeable parts. Stellite seating surfaces. Complete overhaul permitted without removing body from pipe line. Made in bronze, cast iron, cast steel or cast alloy steels. Sizes 1/2" to 6". Other units available for constant differential pressure, unloading, and for remote adjustment. Inlet pressures 25 psi to 1500 psi steam at 950°F. Reduced pressures 2-600 psi.

SEND FOR BULLETIN 5302



Temperature Regulator
Class LTCO

LESLIE TEMPERATURE REGULATORS

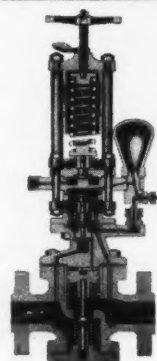
Designed for a wide range of applications. Vary the flow of steam or cooling water to heater or process to automatically maintain constant temperature. Rugged 100° F. adjustable range thermostatic element. For small and large flows, direct operated, direct and reverse acting or with "Duomatic", two-element (pressure and temperature) control. For driers, fuel oil heaters, instantaneous and storage heaters, kettles, open tanks, ovens, process heaters, degreasing machines, steam tables, sterilizers, storage heaters, urns, etc.

SEND FOR BULLETIN 5307

LESLIE PUMP PRESSURE REGULATORS

Accurately and automatically control discharge pressure from steam operated, reciprocating or turbine driven pumps. Single seated—positive—responsive and accessible. No packed plungers or stuffing boxes. Built for constant discharge pressures of 8 psi to 2000 psi and excess pressure of 10-200 psi. For motor-driven pump discharge pressure recirculation.

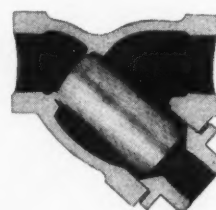
SEND FOR BULLETIN 5306



Pump Governor
Class CTHS-3

LESLIE SELF-CLEANING STRAINERS

Recommended to protect all regulating equipment from dirt and foreign matter. Cast iron, bronze, cast steel, carbon moly, chrome-moly, stainless and forged steels. Strainers with screwed, flanged, socket and butt welded connections; sizes 1/2" to 10" inclusive. Primary service ratings to 2500 psi. Screens furnished in Monel and stainless steel with various perforations and meshes for liquid, gas, air, oil and steam services. For complete details on each type, ask for Bulletin 5308.



Self-Cleaning Strainer

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REGULATORS

LESLIE CO., 281 GRANT AVENUE • LYNDBURST, N. J.

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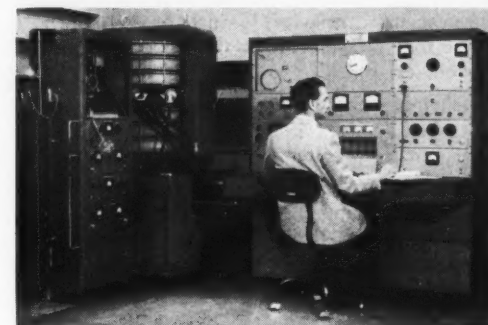
When inquiring check CP 3494 on handy form, pgs. 2-3

INSTRUMENTATION

Analyzes hydrocarbon waxes and other compounds in high mass range

Hydrocarbon waxes and other compounds in the high mass ranges are broken down by recently introduced mass spectrometer. Model doubles range of complete resolution between adjacent peaks by increasing readings to mass 350.

Optional collection systems make possible use of either a 30 mil slit with metastable ion suppressor,



General view of mass spectrometer showing (l to r) inlet cabinet, magnet system and control cabinet

or dual slit arrangement with 30 mil and 7 mil slit without the ion suppressor. Thirty mil slit is used in general range to mass 150, while 7 mil slit is used for higher mass ranges to 700.

Heated inlet system increases scope of the spectrometer by making possible introduction of substances with vapor pressures too low to be analyzed at room temperatures. Installation of heated inlet system can be made in a short time. Attachment fits around the standard inlet system where samples to be analyzed are introduced.

(Model 21-103C is a product of the Consolidated Engineering Corp., Dept. CP, 300 N. Sierra Madre Villa, Pasadena 8, Calif. . . . or for more information check CP 3495 on handy form, pages 2 and 3.)

Gives continuous automatic indication of pH and redox in processing, with laboratory accuracy . . .

indicator is line operated but is not affected by usual fluctuations of AC voltage

Uses: For continuous automatic measurement of pH and oxidation-reduction potential in chemical processing.

Features: Meter, pilot light, and all controls are mounted on face of the chassis, readily accessible inside door of die-cast aluminum case. Case is completely moisture- and splash-proof and un-

affected by corrosive fumes or periodic process washdowns. De-humidifiers are unnecessary inside case. Chassis can be removed by merely disconnecting three plugs.

Description: Panel instrument indicates continuously on 6 inch vertical meter, calibrated for readings in both pH and millivolts (for redox measurements.) Spaded pointer and large numerals make it easy to read from a distance.

Operational features of the indicator are:
Ranges — 0 to 14 pH in 0.1 divisions. For measuring redox potentials; 0 to 700 mv in 5 mv divisions, and 0 to 1400 mv in 10 mv divisions.

Accuracy — 0.02 pH.

Temperature Compensation — Manual compensation by 0 to 100°C calibrated dial. Automatic by use of compensator in electrode assembly. Selection of manual or automatic compensation is governed by toggle switch on face of chassis.

Power Supply — 115 volt, 50 to 60 cycles. 230 volts, 50 to 60 cycles

(Automatic pH indicator is a product of the Leeds & Northrup Co., Dept. CP, 4901 Stenton Ave., Philadelphia 44, Pa. . . or for more information check CP 3496 on handy form, pages 2 and 3.)

Rotatable dial case permits thermometer readings from any position

Mercury-actuated dial thermometer has 3½" diameter dial face. Dial case can be rotated to any readable position. Instrument uses direct drive bourdon coil — no sector, pinion or linkage. Stem is ½" diameter with stainless steel bulb. Stem lengths are 4, 6, 8 and 12". Separable sockets, union connections and flanged union fittings are available.

(Thermometer No. 35-S is a product of Palmer Thermometers, Inc., Dept. CP, 2505 Norwood Ave., Cincinnati 12, Ohio . . . or for more information check CP 3497, pages 2 and 3.)

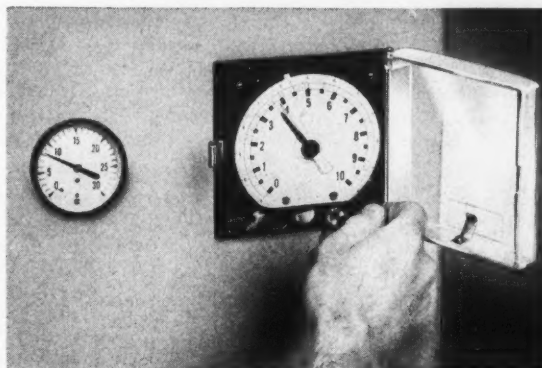
Explains centralized controls for filter backwashing

Illustrated, four-page bulletin explains automatic central filter control system for backwashing rapid sand water filters. Control system signals need for filter backwashing in accordance with loss-of-head conditions. Backwash cycle is then initiated and carried out, and filters returned to operation automatically.

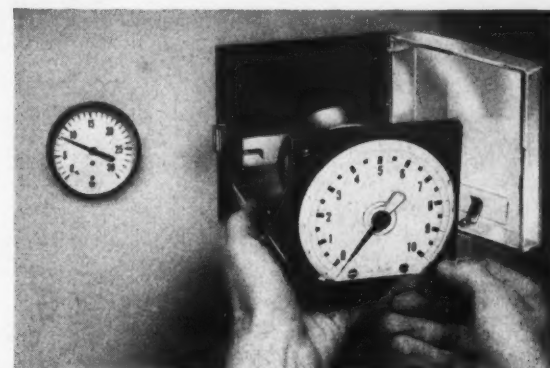
Bul 480-L1 is issued by Builders-Providence, Inc., Div. of B-I-F Industries, 345 Harris Ave., Providence 1, R.I. When inquiring specify CP 3498 on handy form, pages 2 and 3.

You can replace your Metagraphic indicator with a recorder — in less than 10 seconds . . . with no pressure loss

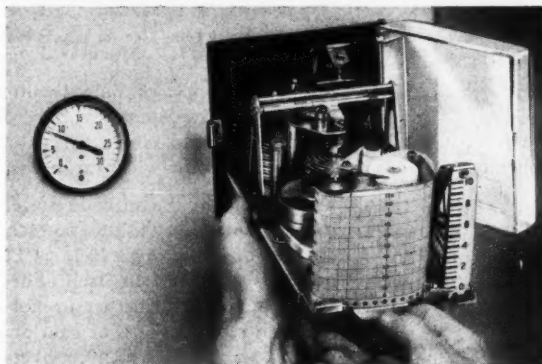
Let's say your graphic-panel-controlled process is at a critical stage. You've got a Metagraphic Indicator in the panel but now you want a *record* of every variation — and you can't afford to upset control. With Bristol's human-engineered Metagraphic system, here's all you have to do:



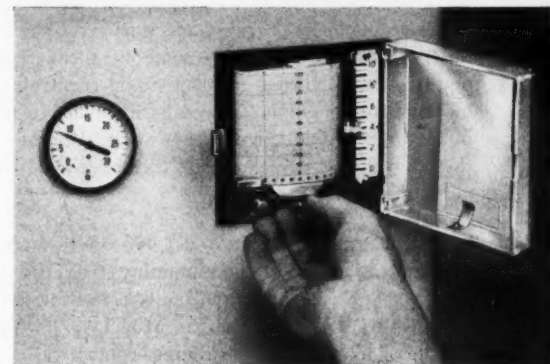
TIME—00:00 Open case door, twist retaining latch securing indicator chassis to case. (Note pressure gage reading.)



TIME—00:02 Pull out indicator chassis. Connections are automatically sealed off. Valve-top pressure stays constant.



TIME—00:05 Slide the Metagraphic recorder chassis into the case. All plug-in connections are made automatically. (Now note that the pressure gage still reads the same.)



TIME—00:08 Push recorder all the way in, fasten latch. Changeover is complete, with no pressure loss, no disturbance of control. In fact, you don't even have to go off automatic control.

4.34

And less than 10 seconds have elapsed! You can get the complete story on Bristol's Metagraphic instruments by writing for Bulletin A106. The Bristol Company, 113 Bristol Road, Waterbury 20, Conn.

BRISTOL

**POINTS THE WAY IN
HUMAN-ENGINEERED INSTRUMENTATION**

AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS

When inquiring check CP 3499 on handy form, pgs. 2-3



NEW Wheelco 400 Series Capacitrol

Offers more control flexibility
for chemical labs



Here's instrumentality in its most flexible and advanced form! Wheelco's new 400 Series Capacitrol gives you a choice of six different control forms — some of them representing the newest developments in automatic control. On-the-job modifications are quickly and easily made to meet a variety of requirements in chemical lab work. You merely "plug-in" the control chassis you want . . . no rewiring or complicated adjustments are necessary.

The new *ultra-sensitive* Model 405 offers a simplified, non-mechanical system for maintaining true proportional relationship between fuel input and a continuously measured temperature. Also new is the Model 407, which introduces "stepless" electric proportioning control.

Servicing is faster and easier with this completely "plug-in" design. Many advance-design features, including: *electronic* "no drift" control . . . extra large, calibrated indicating scale . . . manual "droop" correction and proportioning band adjustment . . . integral thermocouple break protection . . . attractive, modern styling . . . and signal lamps to indicate relationship of control temperature to set point. Remarkably low cost. Ask your Wheelco field engineer for details.

WHEELCO INSTRUMENTS DIVISION

BARBER-COLMAN COMPANY, DEPT. K, 1520 ROCK ST., ROCKFORD, ILLINOIS
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When inquiring check CP 3500 on handy form, pgs. 2-3

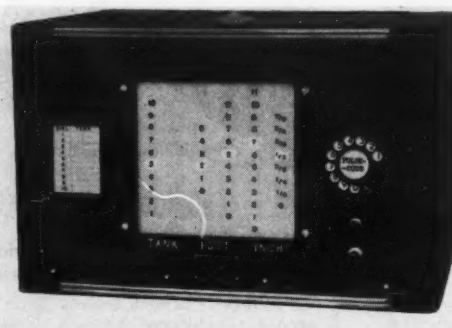
INSTRUMENTATION

**Transmitted electrical pulses
indicate liquid levels
at tank farms . . .**

telemetry system gives readings to nearest $\frac{1}{8}$ inch over unlimited distances

Uses: Designed specifically for telemetering liquid level in petroleum storage tanks and remote control for pumps, valves, and other operating equipment. System may be adapted to other telemetering problems and remote supervisory control applications.

Features: Telemetry system operates over any communication link — metallic pair, single wire and ground, or any carrier system operated over telephone lines or microwave. Amplitude,



Dial on pulse code receiver selects tank to be metered

phase, frequency, or polarity do not effect intelligence. Line resistance, voltage fluctuations, frequency shift and circuit mismatch have no effect on signal within wide variations.

Description: Pulse code system uses arrangement of dots and dashes for each eighth inch increment of liquid level (0 to 59'11 $\frac{7}{8}$ "). Each code group is an entity in itself. For this reason, receiver can detect whether or not complete signal has been received. Loss or gain of any part of code produces a signal which receiver rejects, thus no reading appears.

Output of system is in digital form. Output signal may be fed into computers, printing systems, warning and supervisory systems, without use of auxiliary conversion equipment. Automatic sequencing can be added to provide automatic gaging system.

Receiver contains light indicator panel for showing tank number and foot and inch reading, translating relay network for decoding incoming information and tank selection dial.

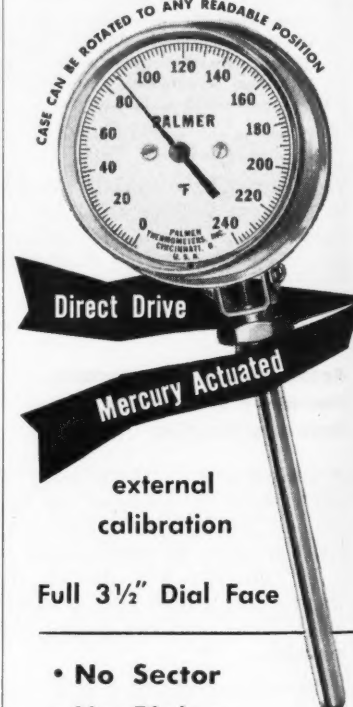
Transmitter, located at storage tank, is a mechanical position transducer. Input to transmitter is mechanical displacement in form of shaft rotation provided by float-operated gage. As float rises with liquid level, perforated steel tape attached to float transmits motion to sprocket sheave, providing

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PALMER

THERMOMETERS, INC.

Norwood Ave., Cincinnati 12, Ohio
Mfrs. of Industrial Laboratory Recording
and Dial Thermometers

When inquiring check CP 3501
on handy form, pgs. 2-3

CHEMICAL PROCESSING

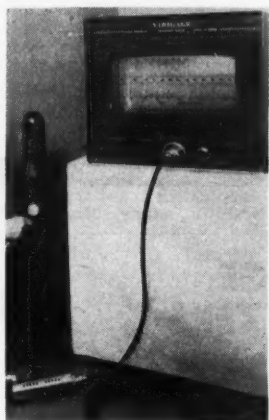
INSTRUMENTATION

shaft rotation proportional to liquid level. Transmitter input shaft is connected through gearing to two code discs, one for foot increments and the other for inch increments.

(Varec Pulse Code Telemetry System is a product of Vapor Recovery Systems Co., Dept. CP, 2820 N. Alameda St., Compton, Calif. . . . or for more information check CP 3502 on handy form, pages 2 and 3.)

Shows thickness of materials on 21" oscillographic screen to accuracy of 0.1% . . .

uses continuous ultrasonic waves generated by small piezoelectric transducer



Position of vertical line of calibrated scale indicates thickness of material being tested

Uses: For non-destructive measurements of thickness and detection of laminar flaws in metals, glass, rigid plastics, and similar materials.

Features: Thickness is read as horizontal sweep on screen which accommodates scales 17" long. Screen may be separated from oscillator assembly by as much as 100 feet without affecting readings.

Description: Sweep-width adjustment permits choice of thickness scales. Instrument reads directly thicknesses from 0.012 to 2.5" with accuracies as high as 0.1%. Frequency calibration allows calculation of thicknesses up to 10".

(Vidigage is a product of Branson Instruments, Inc., Dept. CP, 434 Fairfield Ave., Stamford, Conn. . . . or check CP 3503, pages 2 and 3.)

Gives details and specifications on float position transmitter

Illustrated four-page bulletin gives operating details and data on force-balance rotameter float position transmitter. Typical applications are shown by drawings.

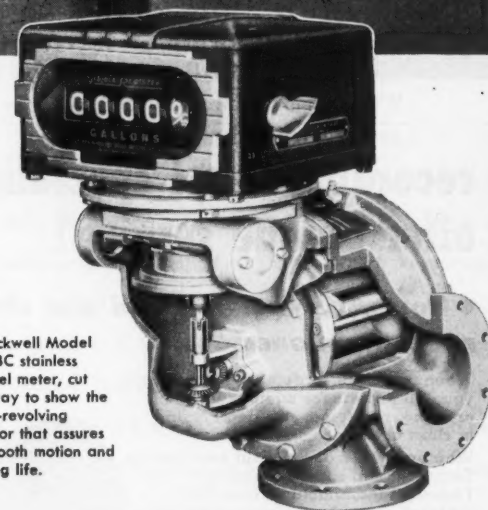
Bul 170 is available from Brooks Rotameter Co., Dept. CP, 47 Dennison Ave., Lansdale, Pa. When inquiring specify CP 3504, pages 2 and 3.

GET POSITIVE CONTROL OVER FORMULAS, COSTS, INVENTORIES... ROCKWELL Stainless Steel METERS



MEASURE CORROSIVE LIQUIDS! Including Foods, Pharmaceuticals, Chemicals and Liquors

Here's a meter especially designed for accuracy and long life when measuring corrosive liquids. It is constructed *inside and out* of stainless steel. With it you can get positive metered accounting for a multitude of liquids that cannot be handled by ordinary meters. Now you can guard the quality of your formulations; keep tab on liquid inventories; have accurate records for cost control and tax analysis purposes. Use the handy coupon for full details.



Rockwell Model 2-BC stainless steel meter, cut away to show the all-revolving rotor that assures smooth motion and long life.

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| Max. Flow Rate _____ gpm. | | Min. Flow Rate _____ gpm. |
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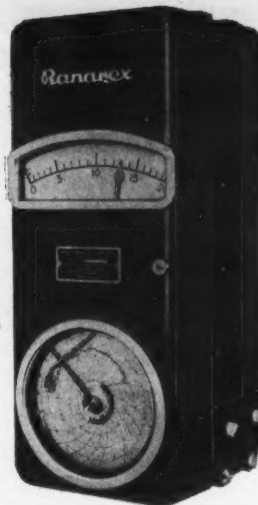
When inquiring check CP 3505 on handy form, pgs. 2-3

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When inquiring check CP 3506 on handy form, pgs. 2-3

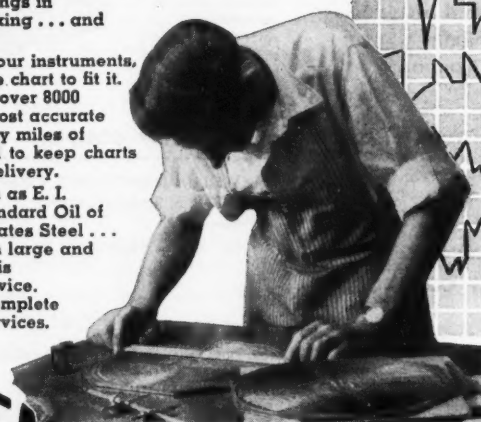
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When inquiring check CP 3507 on handy form, pgs. 2-3

INSTRUMENTATION

**Output as low as 0.2 ma
trips contacts
of relay ...**

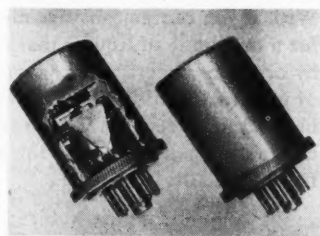
plug-in unit uses armature
balanced on jewel bearing

Uses: Designed to work from output of thermocouple or signals up to 10 amp and 500 volts. Unit finds use as temperature alarm or correction switch, overload protector on voltage regulated power supplies, or switch working from output of photoelectric cell or similar low output device.

Features: Speed of response varies from maximum of 50 contacts per second to 5 second time delay with 1% accuracy.

Description: Relay has permanent magnet balanced armature and is internally shock-mounted. Unit will operate over signal range from 0.2 ma to 10 amp or 0.1 mv to 500v. Higher voltage or ampere signals may be used with external multipliers.

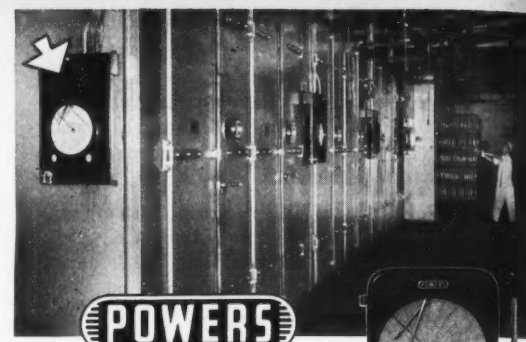
Accuracy of relay is 1% for trip point, differential, less than 1%, and repeatability better than 1%. Contact ratings are 5 to 25 ma DC but may be supplied as high as 0.5 amp. Contacts are SPST (single make, either high or low limit) or SPDT (both high and



Relays are sensitive to signals as low as 0.2 ma

low limits). Units weigh 4 oz and are 1 3/4" diameter by 2 1/4" long. Standard mounting and connection is 9 pin octal plug.

(VHS Relay is a product of Assembly Products, Inc., Dept. CP, Main & Bell Sts., Chagrin Falls, Ohio ... or for more information reader may simply check CP 3508 on the convenient Reader Service slip which is located between pages two and three.)



AIR CONDITIONING CONTROL SYSTEM FOR PROCESSES—Tem-

perature, humidity and air pressure in the modern smoke

houses above are automatically held at the right point with unflinching accuracy by Powers automatic control.

Losses from shrinkage or inferior quality products are eliminated and uniform flavor, color and texture of product are insured by accuracy of Powers control. Your temperature control problem may be different, but like many others for which Powers has supplied the right control. Why not call our nearest office now or write us direct for Bulletin 370. (e13)

THE POWERS REGULATOR CO.
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Over 60 Years of Automatic Temperature and Humidity Control

When inquiring check CP 3509 on handy form, pgs. 2-3

CAMBRIDGE GAS ANALYZERS

Cambridge Gas Analyzers provide continuous records, accurate and automatic. No intermittent sampling ... no chemicals ... no fragile glassware. These Analyzers are used for determination of



OXYGEN in flue and stack gases and in furnace atmospheres

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CARBON MONOXIDE, NITROGEN, ARGON and many other gases can be determined by available single- and multi-point Cambridge analyzers designed to meet specific requirements.

Cambridge five-point gas analyzer provides simultaneous analysis and continuous graphic record of the amount of O₂, CO₂, CO, H₂ and CH₄ in a sample of combustion products.

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When inquiring check CP 3510 on handy form, pgs. 2-3

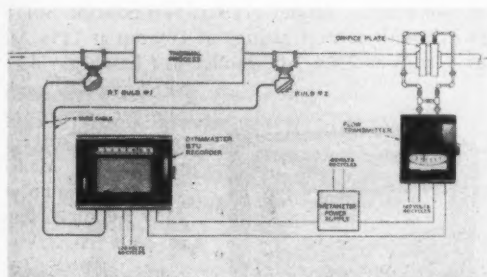
CHEMICAL PROCESSING

**Rate-of-heat input or output
continuously measured
by recorder . . .**

senses flow rate and temperature differential

Uses: For measuring and recording quantity of heat supplied to or drawn from process vessels, heat exchangers, refrigerating plants, etc.

Features: Instrument measures temperature difference with two resistance thermometer bulbs and receives flow-rate from flow transmitter. From



Schematic diagram of control system

two variables, instrument continuously computes and records Btu product.

Description: Totalizer can be furnished with recorder to integrate energy or heat-transfer. Other systems are available that record temperature difference and Btu on a round or strip chart or 2) record flow-rate, Btu, and temperature difference.

(Dynamaster recorders are products of Bristol Co., Dept. CP, 143 Bristol Rd., Waterbury 20, Conn. . . or check CP 3511, pages 2 and 3.)

**You help us decide what
articles appear in CP . . .**

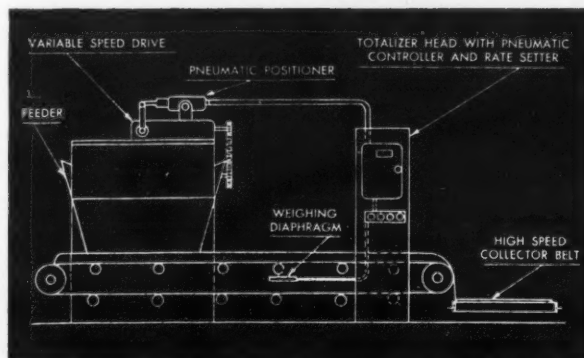
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THE EDITORS

WEIGH IT

...on the Go!

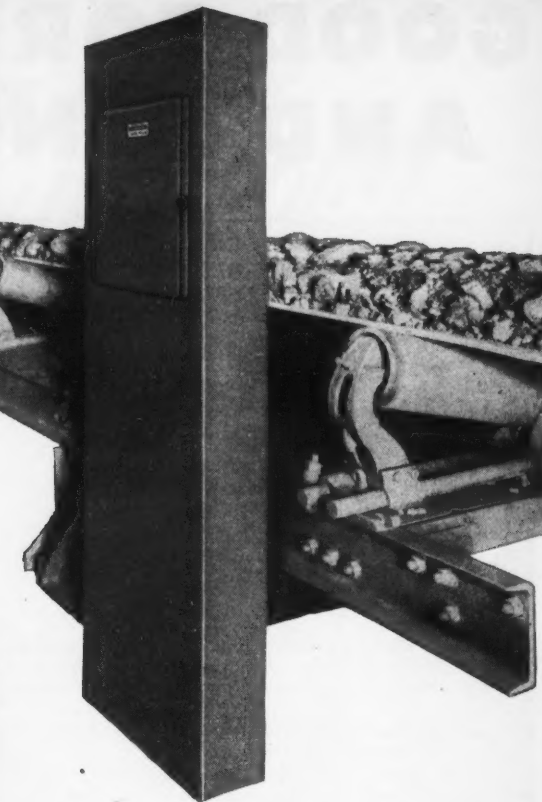


Typical Conveyoflo installation showing Model CFAB-T Conveyoflo Meter controlling flow of tobacco in automatic blending process. Conveyoflo employs pneumatic controller to automatically control feeder output within very narrow tolerances.

Conveyoflo Meters are serving in many other process industries: food, soap, fertilizer, pharmaceutical, steel, paper, glass, heavy chemicals, mining, power. What's your processing problem?

CONVEYOFLO FEATURES

- **ACCURATE** . . . within $\pm 1\frac{1}{2}$ of 1% of actual weight from maximum to 50% of rated capacity; within 1% from 50% to 25% rate; within 2% from 25% to 10% of meter's rated capacity.
- **COMPACT** . . . weight sensing mechanism completely contained within conveyor structure. No overhead levers. Panel stand only 9" x 18" — may be any height.
- **AUTOMATIC TOTALIZER COMPENSATION** for variations in belt speed and changes in belt weight.
- **RESPONDS ACCURATELY** to rapid load variations.
- **PACES AUXILIARY EQUIPMENT** (feeders, controllers, continuous blending processes, etc.) and operates secondary totalizers, indicators, recorders.



Weigh it with BUILDERS CONVEYOFLO . . . the modern meter for continuous, accurate weighing of bulk material passing over conveyor belts. This precision meter can be equipped with a Controller to maintain any desired preset rate of delivery from the conveyor in which it is installed. Or it can be used to pace auxiliary feeders in automatic processing systems. Conveyoflo is furnished as a separate, self-contained unit—or for installation in your present conveyor lines.



BUILDERS-PROVIDENCE
DIVISION OF B-I-F INDUSTRIES, INC.

SEND COUPON
FOR DETAILS

BUILDERS-PROVIDENCE, INC.

387 Harris Ave., Providence 1, R. I.

Please send Bulletin 550-H4 describing Builders Conveyoflo Meter.

Name

Company

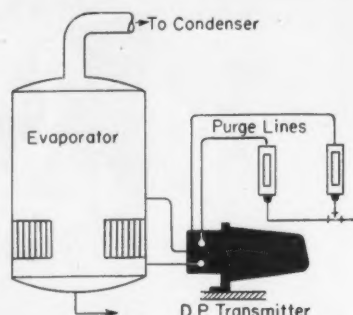
Street

City State

When inquiring check CP 3512 on handy form, pgs. 2-3

GOOD FOR EVERY DAY AND SUNDAYS TOO!

AUTOMATIC PURGING OF SUSPENDED SOLIDS

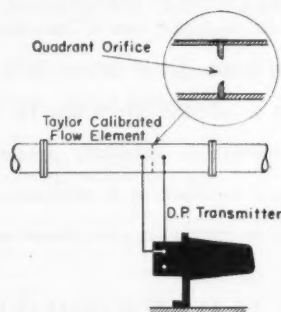


Problem: To obtain uninterrupted liquid level measurement and control where solids in suspension could settle out, plugging lead lines and causing errors in measurement.

Solution: Dual taps provide for complete flushing of the 333RD body as well as the lead lines.

Result: Consistently high accuracy. Flushing of manometer and lead lines cuts maintenance to a minimum. Evaporator efficiency is kept at a uniformly high level.

HIGH ACCURACY WITH VARYING VISCOSITIES



Problem: To get a high order of accuracy in measuring viscous fluids without special calibration curves and frequent changes in calibration due to troublesome variations in viscosity.

Solution: Its low volumetric displacement makes the 333RD transmitter ideally suited to capitalize on the improvements made possible by the recently developed European type quadrant orifice.

Result: Uninterrupted, accurate performance under difficult and variable viscosity conditions.

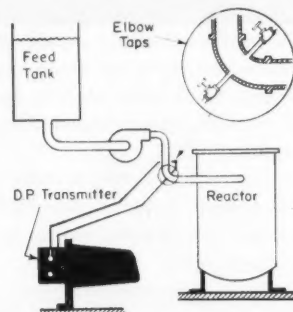
The Taylor TRANSAIRE* Differential Pressure Transmitter (333RD) is simple and economical, yet exceptionally adaptable!

IT'S inexpensive and easy to install—and to maintain. Changes in product or seasonal demand cause no problems, due to quick, simple range change feature. No seal pots—follows flows quickly because of low volumetric displacement. This pneumatic force-balance transmitter, designed to convert differential pressure into an equivalent 3 to 15 psi output, can be used to measure flow of liquid, steam or gas; liquid level or specific gravity. Pressure rating is 1500 psi, and it's available in any desired range from 20" to 800" of water.

Call your Taylor Field Engineer for details, or write for Bulletin 98097. Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada.

*Reg. U.S. Pat. Off.

REVERSING FLOWS AND VARYING VISCOSITY



Problem: Flow control when there are changes in direction of flow and restrictions in the line are not desirable.

Solution: The use of the 333RD transmitter with Elbow Taps, as primary elements. Since there's a tendency to cavitation at the inside tap, the low volumetric displacement of the 333RD makes it particularly suitable.

Result: Accurate measurement, and consequently control, under very difficult conditions.

INSTRUMENTATION

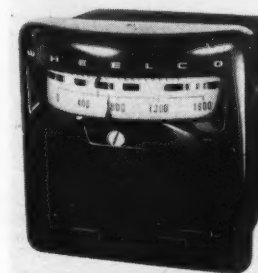
**Automatically shuts off fuel input
and sounds alarm if temperature
exceeds set point . . .**

instrument is fail-safe, shuts off fuel supply in case of thermocouple failure

Uses: Preventing overshooting of critical temperatures in processes or equipment.

Features: Thermocouple break protection automatically shuts off fuel input in case of thermocouple failure or broken connections.

Description: Limitrol controllers are available in two models. Model 711 has two-position SPDT switch with contact ratings of 10 amp at 115v AC or 5 amp at 230v AC. Model 714 has heavy-duty SPST switch with plunger mercury contactor. Contact ratings on Model 714 are 30 amp at 115v AC or 20 amp at 230v AC.



Curved, glare-free 6" scale
has large numerals

Indicating portion of Limitrol is high resistance, compensated, direct-reading galvanometer. Measurement may be obtained with any primary element capable of

producing electrical signal such as thermocouples or radiation detectors. When resistance elements are used, necessary standardizing bridge assembly is provided as accessory.

Dimensions of controller are 9 5/16" high by 9 5/16" deep by 9 1/16" wide. Scale ranges are available up to 3600°F or 2000°C.

(Mod 711 and 714 Limitrol controllers are products of Wheelco Instruments Div., Barber-Colman Co., 1300 Rock St., Rockford, Ill. . . or for more information check CP 3514, pages 2 and 3.)

Gives specifications, data on pneumatic controllers

Illustrated 12-page catalog presents specifications on stack-type pneumatic controllers. Cutaway construction photos, schematic diagrams and dimension drawings are used to explain controllers response actions. Catalog gives complete details on case-mounted, field-mounted, and valve-mounted control instruments.

Cat 53-10 is issued by Fischer & Porter Co., Dept. CP, 148 Jacksonville Road, Hatboro, Pa. When inquiring specify CP 3515, pages 2 and 3.

Taylor Instruments **MEAN ACCURACY FIRST**

When inquiring check CP 3513 on handy form, pgs. 2-3

Gives standards for air pressures in controller systems

Bulletin of four pages outlines tentative standard on air pressures for pneumatic controllers and transmission systems. Standard has been approved by Recorder-Controller Section of Scientific Apparatus Makers Association.

Air Pressure Standard is issued by Recorder-Controller Section of Scientific Apparatus Makers Association, 522 5th Avenue, New York 36, N. Y. When inquiring specify CP 3516 on handy form, pages 2 and 3.

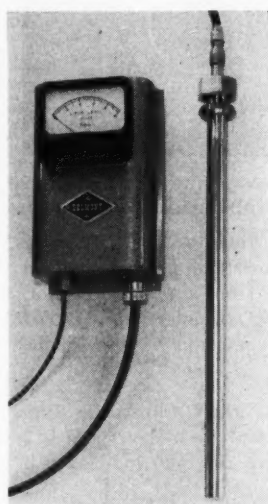
Capacitive sensing element uses no floats, moving parts to show liquid levels . . .

unit operates over range of 500 to -425°F and from high vacuum to 100,000 psi

Uses: For continuous indication of liquid levels over wide range of materials such as non-adhesive chemicals, milk, oils, refrigerants (NH_3 and Freon), and all condensed gases.

Features: Unit uses capacitive sensing element probe with no floating or moving parts or contact-making electrodes.

Description: Various probe lengths, materials, and designs are available to cover ranges in level change and characteristics of indicated medium. Standard instruments provide for 10-foot separation between probe and equipment housing. Unit can be adapted to telemetering with additional equipment. Instrument operates over temperature range of



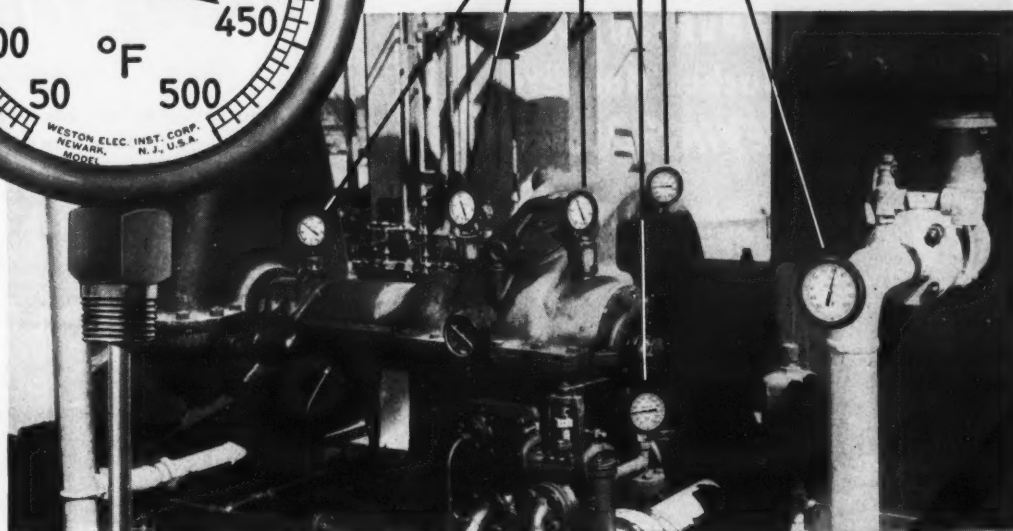
Probe lengths are available to cover ranges in level change and characteristics of indicated mediums

500 to -425°F and from high vacuum to 100,000 psi.

(Belmont Level Indicator is a product of Thermo Instruments Co., Dept. CP, 1310 County Rd., Belmont, Calif. . . . or for more information reader may simply check CP 3517 on handy form, pages 2 and 3.)



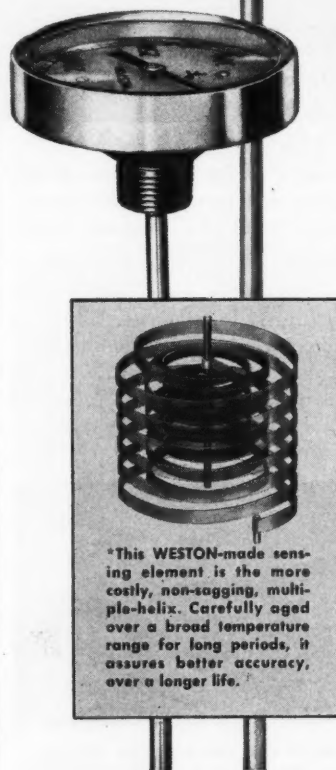
AT EVERY CHECKPOINT



WESTON all-metal THERMOMETERS (with Multiple Helix*)

Here's another typical example of how large processing plants have solved temperature checking problems, and cut thermometer costs besides. With a WESTON dial-type thermometer at every checkpoint, temperatures are read at a glance . . . in far less time, and with far greater accuracy. Their sturdy all-metal construction resists breakage, gives them far longer life on operating equipment. And the exclusive WESTON multiple helix employed assures dependable accuracy during all this long life.

Available in a broad selection of types, sizes, ranges and stem lengths, WESTON thermometers are today standard on all types of mobile and stationary equipment and machines, large and small; as well as on piping, conduit, ducts, etc. Ask your distributor, or local WESTON representative for complete information, or write for descriptive bulletin . . . WESTON Electrical Instrument Corporation, 614 Frelinghuysen Avenue, Newark 5, New Jersey.



WESTON Thermometers

Stocked
by leading
Distributors

When inquiring check CP 3518 on handy form, pgs. 2-3

HERE'S HELP!

Hapman MULTIPLANE TROLLEY CONVEYOR with STIF-ARM Bucket Hangers CUTS CONVEYING COSTS!



**Permits
operation in
all planes
with a single
I-beam trolley
— a single
drive unit.**

**for handling —
BULK MATERIALS SUCH AS
COAL, ASHES, CHEMICALS,
ETC. AS WELL AS PARTS
AND SUB-ASSEMBLIES
USING TRAYS OR BASKETS.**

**WRITE FOR YOUR COPY
OF THIS NEW BULLETIN CP-1154**

Hapman CONVEYORS, INC.
DIVISION HAPMAN-DUTTON COMPANY
KALAMAZOO MICHIGAN

In British Commonwealth & Europe:
Fisher and Ludlow Ltd., Birmingham

In Canada:
Canadian Vickers Ltd., Montreal

Water-bed conveyor replaces block method
at Columbian Carbon Co. in . . .

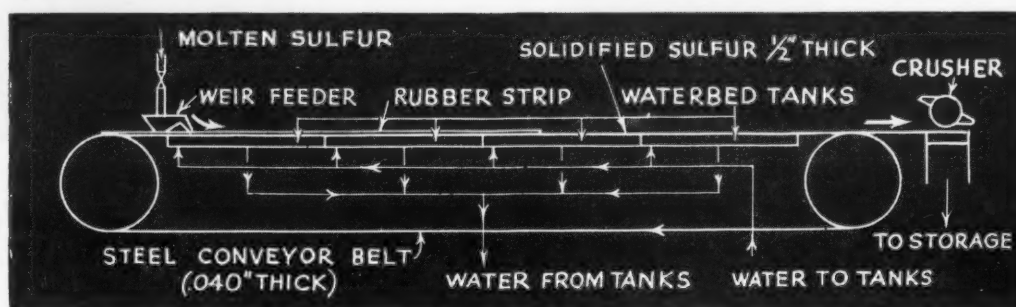
cooling and solidifying molten sulfur

**Sulfur produced in ready-to-ship
form — no further processing
necessary**

H. E. MEANS
Superintendent, Gasoline Plants
Columbian Carbon Company
with **R. J. CALLAHAN**, Assistant Editor

accumulating sulfur moved up four inches daily. This block method not only required expensive drilling and blasting operations but fines were lost in blasting as well. When additional resizing was necessary to meet buyers' specifications, loss of fines became excessive.

Solution: In March, 1954, a continuous belt cooler (stainless steel conveyor) was installed. Although similar equipment had been used in Europe, this was the first one used for cooling and



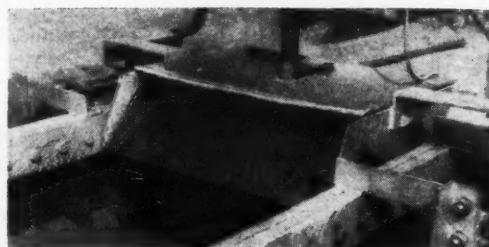
Problem: Cooling and solidification of molten sulfur was formerly a slow non-continuous process at the sulfur recovery plant of Columbian Carbon Co., Seminole, Texas.

Eight 7" channel irons were set in the ground vertically to a height of 15 ft forming an enclosure 30 ft square. Channel irons were slotted at intervals to accommodate 2 x 1/2" bolts. Seven inch horizontal channel irons were raised progressively and bolted in place for a retaining form as the

solidification of molten sulfur in the US.

Molten sulfur recovered from acid gas resulting from a natural gas desulfurization process is poured directly on the steel belt from a weir distributor. Moving towards a crusher, the material is cooled by circulating water in open tanks over which the steel belt "floats".

Belt is 32" wide and .040" thick. Capacity is 2800 lb per hr or 30 long tons per day. Belt speed is 2 to 8 ft per minute. Drive for belt and flaker is

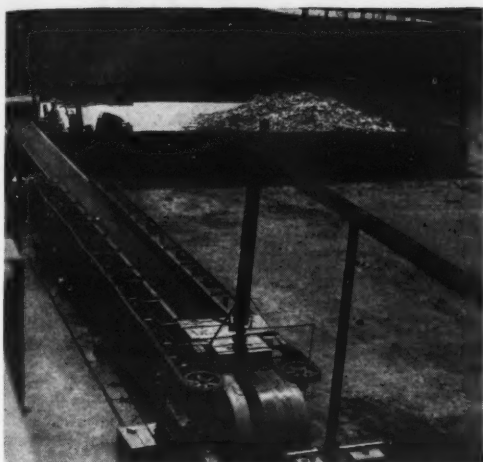


Molten sulfur is fed to steel conveyor from weir distributor. Squeegee arrangement not visible prevents sulfur from flowing back



Rubber side shirts retain molten sulfur on belt until it solidifies. Belt carries material to crusher where it is broken into 8 x 6" pieces

When inquiring check CP 3519 on handy form, pgs. 2-3



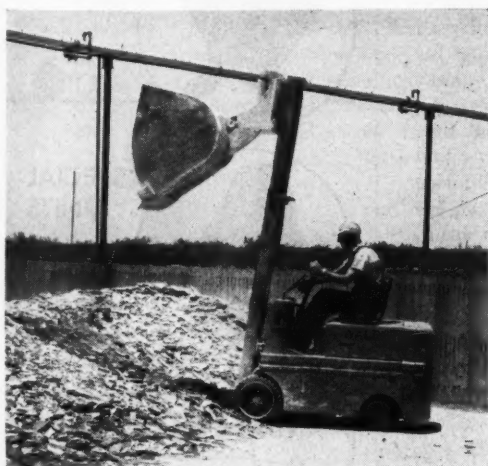
Black insulated line overhead carries molten sulfur from natural gas desulfurization process to water-bed conveyor. Black and channel iron construction are shown in upper right background

furnished by two $\frac{3}{4}$ hp motors. Conveyor is 52 ft long, center to center.

Initial material temperature is 275 to 290°F and initial water supply is 85°F. Required total water flow is 60 gpm. Density of material is 113 lb per cu ft and thickness of material deposit approximately $\frac{1}{2}$ inch.

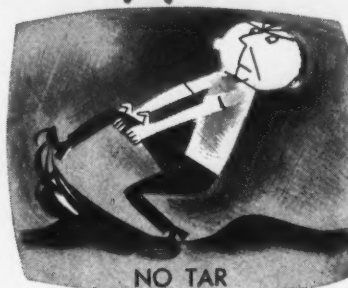
Rubber side skirts form a dam to retain molten sulfur on belt up to point where it is cooled past liquid state. Sulfur does not adhere to the belt itself but the rubber side strips need to be moistened by steam. Since conveyor moves at such low speed there is a tendency for the sulfur to flow back at the loading end. This is overcome by having a squeegee arrangement on weir feeder.

(Continued on next page)



Operator uses tractor shovel to move sulfur from flaker to back of storage pad. Overhead line is steam jacketed sulfur line to block storage

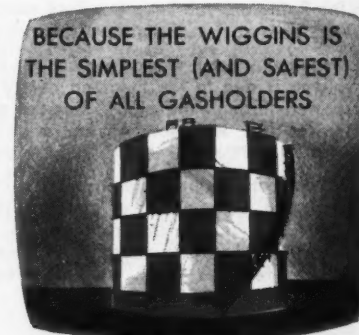
Only the Wiggins Gasholder*



has the dry fabric seal that



eliminates maintenance problems!



Write for information

*PATENTED



**GENERAL AMERICAN
TRANSPORTATION CORPORATION**
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Chicago 90, Illinois

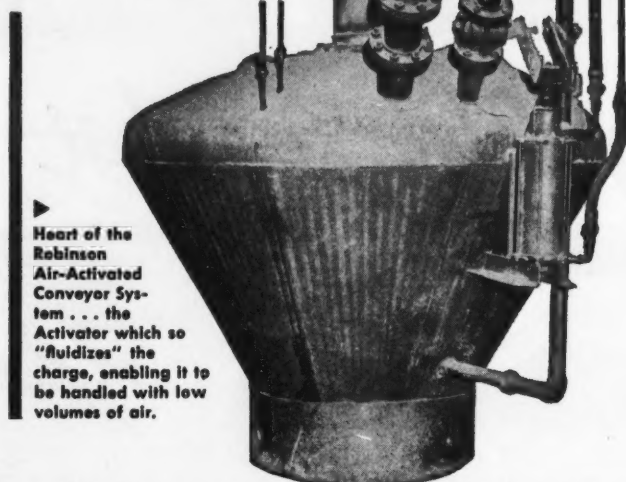
When inquiring check CP 3520 on handy form, pgs. 2-3

Robinson

Air Activated

Conveyor

The
Low-volume
Air Conveyor



► Heart of the Robinson Air-Activated Conveyor System . . . the Activator which so "fluidizes" the charge, enabling it to be handled with low volumes of air.

Averages 1 Cubic Foot of Air per Pound of Materials Handled

Right here is one reason — and a stand-out reason — why the Robinson Air-Activated Conveyor is so economical in handling bulk dry-pulverized and fine-granular materials. Compressed air costs money so, if you can hold air costs down, as with the Robinson, you keep handling costs down. And no other power is necessary to operate a Robinson System.

The reason why the Robinson System can operate with such low air volume is due to the fluidized nature of the charge when transported through the pipes. Pressure alone will not suffice. It requires this Robinson Air-Activation or fluidizing effect. Material "flows" rather than blasts through.

Many Robinson Systems are in service handling a variety of products and in some cases are transporting them several thousand feet. This system may be just what you need for handling those dry, bulk materials in your plant. It has several outstanding features which we'll be glad to discuss at your convenience.

ROBINSON

Air Activated

A Division of
Morse Boulger Destructor Co.

CONVEYOR SYSTEMS

211-V EAST 42nd ST. • NEW YORK 17, N. Y.

Representatives in Principal Cities

When inquiring check CP 3521 on handy form, pgs. 2-3

MATERIAL HANDLING

(Continued from preceding page)

The strip of solidified sulfur enters a flaker at end of conveyor belt where it is broken into pieces approximately 8 x 6 inches. It drops into a 50 x 50 ft reinforced concrete storage pad which has 48" high, 4" thick retaining walls. It is then handled by a tractor shovel.

Results: Besides the obvious advantage of having a continuous operation for cooling and solidifying the sulfur, there has been a substantial reduction in loss of fines. Also a more flexible arrangement for shipping the finished product is possible. While formerly shipments were sporadic due to relatively long periods required to accumulate a block of any consequence, the water-bed conveyor delivers the sulfur in shipping form — no reprocessing is necessary. Now box cars can be loaded as soon as there is sufficient product available. There have been no maintenance problems to date.

(Conveyor is a development of Sandvik Steel, Inc., Dept. CP, 111 8th Ave., New York 11, N. Y. . . . or for more information check CP 3522 on handy form, pages 2 and 3.)

Bulk granular materials shipped in collapsible containers of synthetic rubber . . .

provides simplified receiving and handling of up to 2500 gallons of material



Synthetic rubber and fabric containers of 500 and 2500 gal capacity provide way of handling bulk shipment of granular and powdery material. Containers can be collapsed after emptying for return and re-use. They are being used for shipments of polyethylene and polyvinyl chloride at present. They are

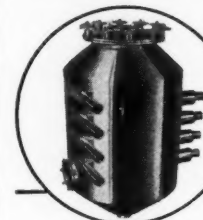
being tested for bulk shipment of carbon black, starch, clay, flour, sugar, malt, granular reclaim rubber and many corrosive and hygroscopic materials.

(On page 73 of September **CHEMICAL PROCESSING** it was stated incorrectly that these containers are a product of Firestone Tire and Rubber Company. Firestone is testing the container for carbon black handling, not producing it. Carbon black is received from Cabot Carbon Company which purchased container from U.S. Rubber Co. This collapsible vessel was developed by U.S. Rubber Co. which holds the patents and is its sole manufacturer.)

Alloy Metals

Fabricated by Littleford
for the Chemical
Process Industries

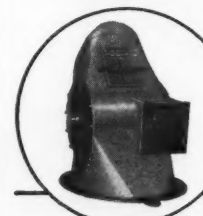
The Fabrication of Alloy Metals requires exacting, skillful workmen with the skill to shear, form and weld each metal with unerring precision. Littleford has fabricated such metals as Stainless Steel, Monel, Everdur, Nickel, Inconel, Herculoy and Aluminum into hundreds of products used by the Process Industries. Experience, plus modern equipment and a definite responsibility for the quality of the finished product are assurance of the finest workmanship. If you have a problem involving Alloy Metals, send your blueprints to Littleford for an estimate of cost, or write for Bulletin on Alloy Fabrication.



TANKS
PLAIN
PRESSURE
CODE



**HOPPERS
TROUGH
BINS**



**SPECIAL
UNITS**



LITTLEFORD

LITTLEFORD BROS., INC.
417 E. Pearl St., Cincinnati 2, Ohio

When inquiring check CP 3523
on handy form, pgs. 2-3

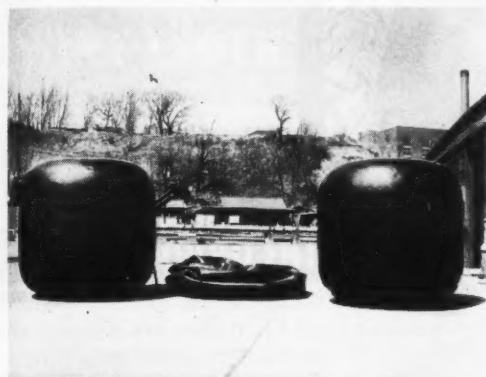
CHEMICAL PROCESSING

MATERIAL HANDLING

The 370 cu ft (2500 gal) container is 8' in diameter and 8' high. Air or gas can be pumped into filled container to provide additional rigidity during handling. Collapsed for storage or return shipment, it is only 2' high.

The 70 cu ft (500 gal) container is 3'10" in diameter and 7' high. It collapses into bundle 10" high. Both containers can be shipped by barge, rail or truck. They are non-corrosive, vermin-proof, leak-proof and can be stored outdoors or indoors.

They are built like a tire with a number of plies of high strength cord fabric and synthetic rubber molded into one piece. These are internally reinforced by



2500 gallon synthetic rubber and fabric containers provide way of handling bulk shipments of granular and powdery materials. Container in center shows how they can be collapsed for return and re-use

several strong, flexible lifting cables which are attached to single lifting ring at top of container.

Exterior and inner lining are neoprene rubber. There is a 6" closure in each end for emptying and filling. Arrangements are being made by the manufacturer to lease the containers at a monthly rate if desired.

(Containers are a product of the U.S. Rubber Co., Dept. CP, Rockefeller Center, New York 20, N.Y. . . . or for more information reader may simply check CP 3524 on the convenient Reader Service slip which is located between pages 2 and 3.)

Elevating tables and trucks shown in catalog

Illustrated 12-page catalog shows elevating work tables and work lifter units. Accessories and attachments for both hand powered and electric hoisting units are also included in publication.

Cat 54 is issued by Standard Products Div., Economy Engineering Co., Dept. CP, 4511 W. Lake Street, Chicago, Illinois. When inquiring specify CP 3525 on handy form, pages two and three.



**\$10 per day for one year
buys this rugged
bulk-handling SHOVELoader**

For only \$3395*, less than \$10.00 a day for one year . . . much less than you pay a laborer with a hand shovel . . . you can own a Baker-Lull 12 cubic foot SHOVELoader. And you get a lot more for the money!

Check all of these features and see why this SHOVELoader compares with others costing \$350 to \$400 more. The lift height is a tall seven feet with lifting capacity a husky 1500 pounds . . . 500 pounds more than most competitive units. The loader arms are located out in front of the operator—not around him—to keep him safe from injury and give him clear-view visibility at all times. The bucket can be cradled low too, giving

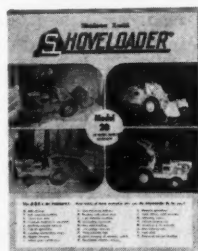
him unobstructed forward visibility and making it unnecessary to drive backward as with other units. Maximum travel speed is 14 MPH. Plenty of bucket tilt back at ground level makes it easy to get a full bucket every time from stockpiles . . . letting you reduce handling costs by moving more bulk in a shorter time.

Attachments let you do more types of work too. Lift forks let you handle palletized loads, the crane hook gives you a portable hoist, and special buckets are available for handling dense materials. Exhaust-destroying catalytic equipment is also available for indoor use where necessary.

Baker-Lull SHOVELoaders are available in sizes ranging from 12 cubic feet to 1½ cubic yards four wheel drive. Should you desire information on other sizes please specify when writing. The BAKER-LULL Corporation, 315 West 90th Street, Minneapolis 20, Minn.

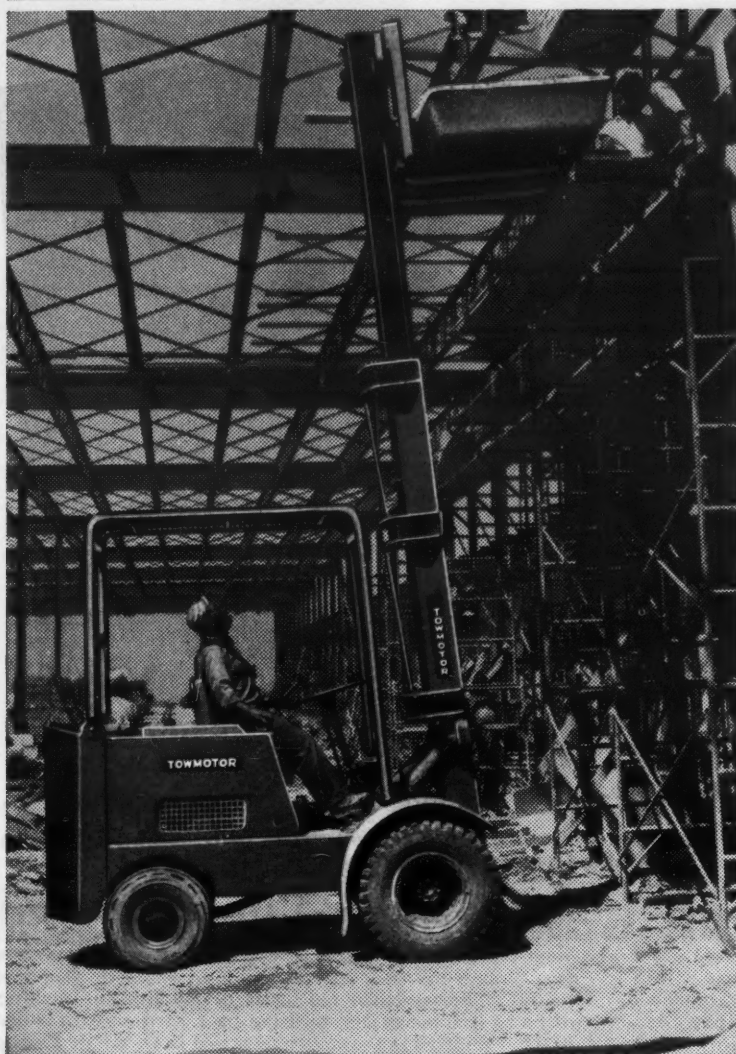
*F.O.B. Minneapolis

• Write for your copy of Bulletin AD78A containing full information about the Baker-Lull, Model 20, 12 cubic foot SHOVELoader which sells for only \$3395.00.



When inquiring check CP 3526 on handy form, pgs. 2-3

NEW IDEA



GOING UP... 1/2 ton of mortar!

Making light work of heavy lifting is Towmotor's job here . . . delivering a half ton of mortar to the work level in seconds. Your handling problem, inside or outside, can also be solved with Towmotor efficiency. Your nearby Towmotor representative is a materials handling specialist. Have him analyze your materials handling needs or write for special Job Studies covering *your industry*. TOWMOTOR CORPORATION, Div. 2311, 1226 E. 152nd St., Cleveland 10, Ohio.

TOWMOTOR

THE ONE-MAN-GANG

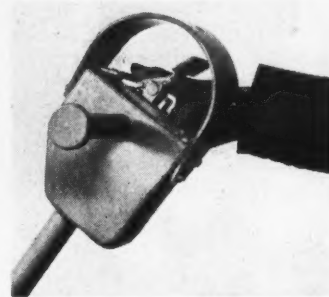
FORK LIFT TRUCKS and TRACTORS
Since 1919

When inquiring check CP 3527 on handy form, pgs. 2-3

MATERIAL HANDLING

Provides easier operation and speed control on electric truck

Butterfly speed control unit provides easier operation of operator-led electric industrial trucks. Double-wing finger bar actuates pushbutton forward-reverse control on trucks. Simple depression by thumb or forefinger (forward or back) controls two speeds forward and two reverse speeds.



Unit for finger-tip control of forward and reverse speeds

Change-over kit for converting manufacturer's electric trucks to new control is available.

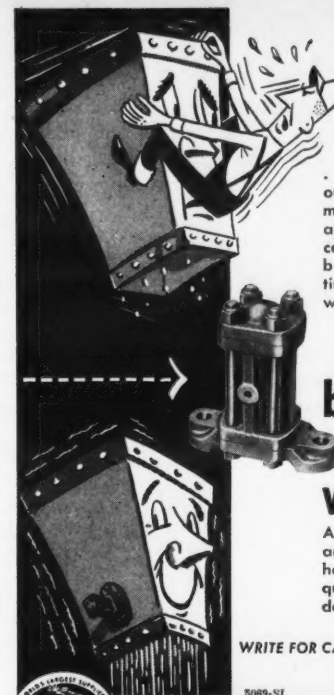
(Speed control unit is a product of Automatic Transportation Corp., Dept. CP, 149 W. 87th St., Chicago 20, Ill. . . or for more information check CP 3528, pages 2 and 3.)

Ore and coal unloaders described in booklet

Equipment and structures for handling coal, ore and other bulk materials are described in 32-page illustrated booklet.

Booklet discusses mechanical, electrical and structural features of such equipment as ore and coal bridges, man trolley unloaders, rope-operated towers, replacement trolleys, hydraulic buffers and rail clamps.

Booklet "Handling Bulk Materials" is issued by the Dravo Corp., Dept. CP, Neville Island, Pittsburgh 25, Pa. When inquiring specify 3529 on handy form, pages 2 and 3.



There's a **BETTER WAY...**

. . . than either pounding or profanity to keep bulk materials flowing from bins and hoppers. Clogged bins cause serious production bottlenecks. Don't lose time, money and patience when you can . . .

Make bins behave with SPO VIBRATORS!

A complete range of types and sizes is available to handle every vibration requirement. For complete details . . .

WRITE FOR CATALOG 50



SPO INCORPORATED

6531 GRAND DIVISION AVE. • CLEVELAND 25, OHIO

When inquiring check CP 3530 on handy form, pgs. 2-3

Get all these Advantages with

"Metalsmiths" Stainless Steel and Monel Utensils

- Fully Corrosion resistant
- Extremely durable
- Efficiently designed
- Expertly fabricated
- Easily cleaned
- Backed by 30 years experience
- Prompt shipment anywhere



WRITE FOR LATEST CATALOG — PRICE LIST



METALSMITHS

Division of Orange Roller Bearing Co., Inc.

556 White Street Orange, N. J.

When inquiring check CP 3531 on handy form, pgs. 2-3

CHEMICAL PROCESSING

FREE



WIRE CLOTH

STOCK LIST

Mailed periodically. Lists all types of wire cloth ready for immediate delivery to you. Includes the most frequently used types, some specials and "remnant" items. Lets you schedule your purchasing to meet production needs. Also assures immediate delivery on emergency orders.

If you're not already receiving this monthly list, *write today*. There's no obligation, of course.

CAMBRIDGE INDUSTRIAL WIRE CLOTH

... is famous for accurate mesh count and uniform mesh size. Capacities range from 20 x 250 mesh up to 4" openings; any metal or alloy. And, we'll be glad to quote on special materials. *We also build special wire cloth fabrications to your specifications.*

Write direct or call your Cambridge Field Engineer. See "Wire Cloth" in your classified telephone book.



The Cambridge Wire Cloth Co.
Dept. F • Cambridge 11, Md.

WIRE CLOTH METAL CONVEYOR BELTS SPECIAL METAL FABRICATIONS

OFFICES IN PRINCIPAL INDUSTRIAL AREAS

When inquiring check CP 3532 on handy form, pgs. 2-3

NOVEMBER, 1954

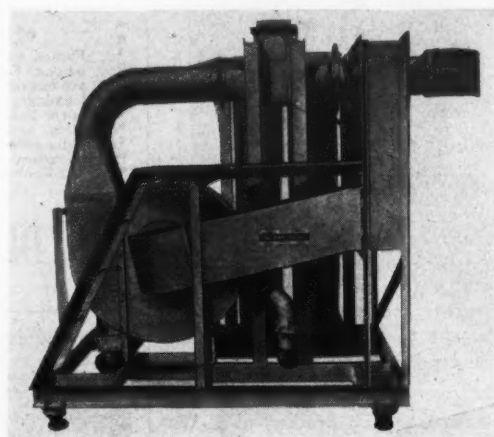
MATERIAL HANDLING

Loads boxcar of bulk material in two to four hours . . .

loader travels on casters for portability and can be used to load at many stations

Pneumatic car loader is fed from overhead screw conveyor through rotary valves and will load an 80 thousand pound boxcar in from two to four hours. Loader is equipped with two filter tubes and eliminates dusting by putting slight negative pressure on the car.

Fan handles more air than is blown into car, bleeding off a small percentage which goes into the filter



Loads 40 ton boxcar in two to four hours

tubes. When run is completed, opening of a valve cleans out dust accumulated in bottom of filter and puts it into car.

Unit travels on casters for portability and can be used to load at many stations. When located at station desired, loader is easily raised off casters and set down to solid position.

(Pneumatic car loader is a product of the Day Co., Dept. CP, 820 Third Ave., N.E., Minneapolis 2, Minn. . . or for more information reader may simply check CP 3533 on handy form which is located between pages 2 and 3.)

Pictures maintenance equipment on various jobs

Illustrated 16-page booklet shows action photographs of tractors, motor graders, motor and pull scrapers, motor wagons, and power units.

"New Economy" bulletin is available from Tractor Div., Allis-Chalmers Mfg. Co., Dept. CP, 1125 S. 70th St., Milwaukee 1, Wisc. When inquiring reader may simply specify 3534 on handy form which is located between pages 2 and 3.



For different types of products, Gaylord supplies Drumpaks in hexagonal and octagonal shapes.

Tough to pack it? DRUMPAK IT!



CORRUGATED AND SOLID FIBRE BOXES • FOLDING CARTONS
KRAFT PAPER AND SPECIALTIES
KRAFT BAGS AND SACKS

Because of its unusual adaptability in size and shape, a wide range of products are being profitably shipped in Drumpak. Water heaters, air conditioners, furnaces, forgings, carpets and bulk chemicals are just a few. The Gaylord-originated Drumpak design cuts packing costs, speeds product handling, gives greater protection and is easier for the customer to open.

You'd be interested in some of our Drumpak cost-saving case histories. Call your nearby Gaylord sales office.

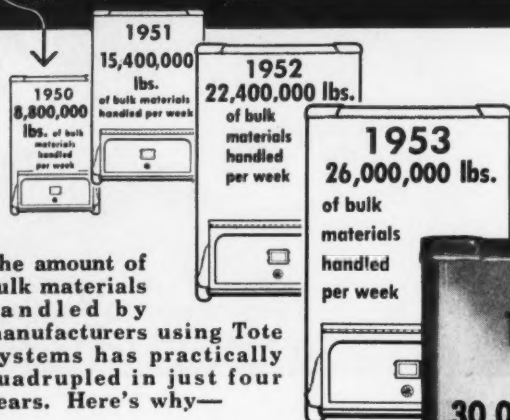
GAYLORD CONTAINER CORPORATION • ST. LOUIS

SALES OFFICES FROM COAST TO COAST • CONSULT YOUR LOCAL PHONE BOOK

TOTE SYSTEM*

(complete bulk material handling system)

is going places



The amount of bulk materials handled by manufacturers using Tote Systems has practically quadrupled in just four years. Here's why—

Manufacturers have found they can save from 18 cents to 85 cents per hundredweight in handling a wide variety of bulk materials including sugar, flour, salt, soap, detergents, cocoa, cement, whiting, carbon black, powdered coffee, powdered plastics, fluorescent powders, ethocel, and polystyrenes.

Tote*—built around easily handled aluminum bins—makes these savings possible because it is a complete, automatic, mechanical system for filling, storing, transporting, discharging, weighing, and blending all types of bulk materials, including liquids.

Tote saves on labor costs, container costs, storage costs, freight claims, product loss, product contamination and deterioration, and inventory. It is equally effective for in-plant or inter-plant operations.

Write for Illustrated Literature

TOTE SYSTEM, incorporated

680 So. 7th, BEATRICE, NEBRASKA

Tote Engineers will survey your plant to determine the savings you can effect, at no cost or obligation.

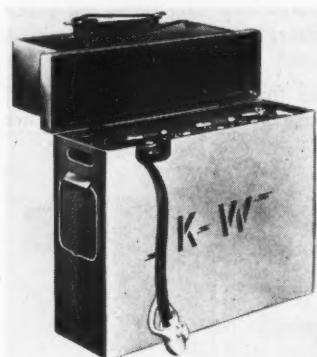
*Tote and Tote System Reg. U. S. Pat. Off.

When inquiring check CP 3535 on handy form, pgs. 2-3

MATERIAL HANDLING

Built-in battery charger on lift truck battery plugs into 110v

Charger-equipped power unit for operator-led lift trucks enables battery charging to be done when trucks are idle. Battery remains



on trucks when charger is plugged into 110v, 60 cy AC outlet. Charger can be left on without damage to battery when routine charging is done overnight.

(K. W. type Charger 6 SPC-11 power unit is a product of K-W Battery Co., Dept. CP, 3574 W. Howard St., Skokie, Ill. . . or for more information check CP 3536 on handy form, pages 2 and 3.)

Allows conveyors to cross aisles

Counter-balanced air operated gate allows conveyor to cross aisles. Simple push button arrangement on either side of gate permits raising and closing of gate from either side.

Fork lift truck operators can lift and lower gate without getting off truck. Length of gate is determined by width of aisle.

(Conveyor gate is a product of the Sage Equipment Co., Dept. CP, 30 Essex St., Buffalo 13, N.Y. . . or for more information reader may simply check CP 3537 on the convenient Reader Service slip which is located between pages two and three.)



NEW CATALOG 754

An Aid in the Quick Selection of Stock Roller Chains and Sprockets

Packed with helpful information and useable data, this new 64-page Catalog 754 will be found valuable to engineers and production men. How to select a stock drive; calculate chain length; installation recommendations; speed ratio tables; ready-to-use finished-bore and taper-bushed sprockets; flexible couplings and complete roller chain technical data, all pitch sizes—are some of the topics covered . . . A copy will be mailed free on request . . . DIAMOND CHAIN COMPANY, Inc., Dept 411, 402 Kentucky Ave., Indianapolis 7, Ind.



When inquiring check CP 3538 on handy form, pgs. 2-3

USE THIS NEW SAFETY MATERIAL ALL OVER YOUR PLANT

Work platforms



Flooring



Gutter Covers



Partitions



Safety Grip-Strut

NON-SKID—RUGGED—LOW COST

Safety Grip-Strut is a new basic material. All one piece, steel or aluminum, in various sizes and gauges. Sold like lumber, used like lumber and stocked in your storeroom like lumber. Ideal for on-the-job fabricating. Not welded, riveted or expanded. It presents an open space, in a diamond shaped pattern, in excess of 75% of the area for ready access of light and air and gives a positive NON-SKID footing in all directions. Ideal for stair treads, fire escapes, cable trays, work platforms, catwalks, flooring and for original equipment safety treads. Your own mechanics can install it—it's inexpensive, yet permanent and safe.

Write today for new catalog showing loadings and methods of easy application in your plant.

Distributors in all principal cities.

GRIP-STRUT division THE GLOBE COMPANY

Manufacturers since 1914
4006 S. Princeton Ave. • Chicago 9, Ill.

When inquiring check CP 3539 on handy form, pgs. 2-3

CHEMICAL PROCESSING

MATERIAL HANDLING

Eliminates wasted tote box space by single layer handling in shallow trays . . .

trays tier in rigid stacks permitting transport of large unit loads on skids or pallets

Uses: For handling parts not adapted to boxes. Can be used in conjunction with powered belt, overhead, wheel and roller conveyors.

Features: Empty trays nest, saving valuable floor space. Up to 200 trays can be nested in area 4' x 4' x 25".

Description: Die made trays are available in either cold rolled steel or aluminum. Dimensions



Shallow materials handling tray allows single layer transporting of parts without wasting space. Empty trays nest as shown on right

are 22 3/4" in length, 4 1/4" high, and 11" wide. The 18-gage (.047") steel tray weighs 7 lb, the aluminum tray (.064") 3 1/2 lb.

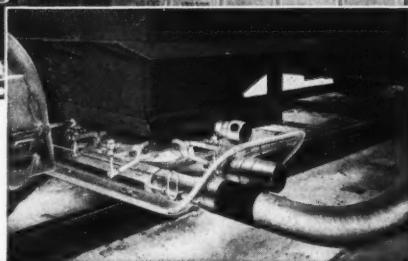
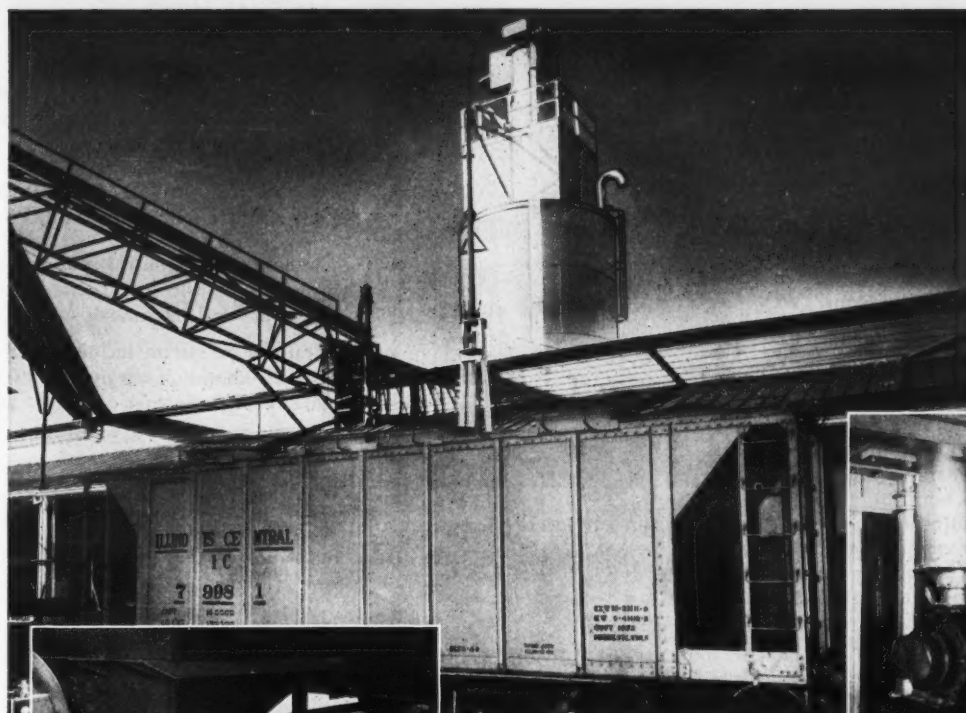
When trays are tiered each unit rests on upraised handle of tray below. Because of double-hopper ends, contents remain visible and accessible.

(Model 224 trays are a product of the Chas. Wm. Doepke Mfg. Co., Inc., Dept. CP, 8825 Blue Ash Rd., Rossmoyne, Ohio . . . or for more information check CP 3540 on handy form, pages 2 and 3.)

Catalogs transmission belts and allied rubber products

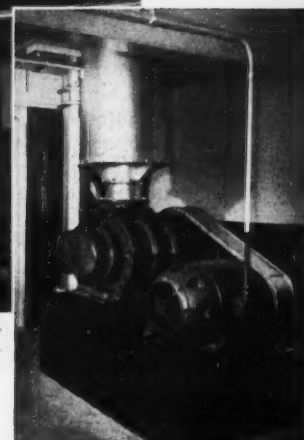
Illustrated catalog covers V-belts, transmission belts, conveyor belts, and rubber hoses and pipe flanges.

Cat 25-C is issued by Manhattan Rubber Div., Raybestos-Manhattan, Inc., Dept. CP, 92 Townsend St., Passaic, N. J. When inquiring specify CP 3541 on handy form, pages 2 and 3.



Portable twin nozzle attached to car hopper.

Hopper-bottom car being unloaded. Airveyor filter installed above storage bin. Shows permanent conveying duct from car to filter.



Exhaustor unit which furnishes the air-power for the Airveyor system.

Avondale unloads bulk starch with **AIRVEYOR**

Avondale Mills at two of its plants, Alexander City and Pell City, Alabama, is using the Airveyor System for unloading and conveying bulk starch from hopper-bottom cars. Illustrated above is the system installed at Alexander City for unloading and delivering the starch to a storage bin.

Previous to the installation of the Airveyor System at Alexander City, starch was received in bags; some were broken in transit and in trucking from cars to the warehouse.

The Airveyor has changed this. Waste is reduced to a minimum; hand trucking is eliminated. Labor required—two men to attach and detach twin nozzle to hoppers of the car. Unloading time, approximately 2 hours and twenty minutes for one car. Starch is available to the slasher room from the storage bin with a capacity of approximately three carloads.

If you are still *manhandling* your incoming starch in bags, it will pay you to get all the facts about the Airveyor for pneumatic conveying. Why not take advantage of Fuller's 27 years of experience in air-conveying? Write today for full information.



FULLER COMPANY—CATASAUQUA, PA.

Branch offices

Chicago • San Francisco • Los Angeles • Seattle • Birmingham

DRY MATERIAL CONVEYING SYSTEMS AND COOLERS—
COMPRESSORS AND VACUUM PUMPS—

FEEDERS AND ASSOCIATED EQUIPMENT

A-179
2245

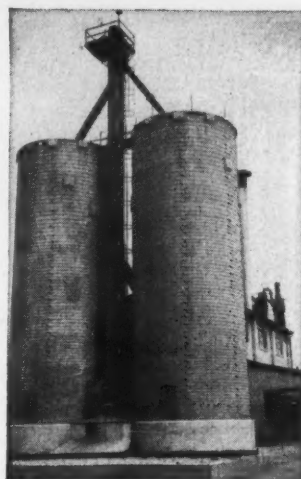
When inquiring check CP 3542 on handy form, pgs. 2-3

Here's the way to handle and store bulk materials

You are looking at two Neff & Fry storage bins at the Monroe, Mich., plant of Detroit Stoker Co. They are used for handling and storing coal. Each is 20' dia. x 55' high. Total capacity is approximately 1600 tons. We also erected three 14' x 40' bins for the same company to handle and store foundry sand.

Naturally, materials are put into and withdrawn from the bins by power, eliminating virtually all manual labor. We collaborated with the manufacturers of equipment in designing the conveying systems.

Our bins (silos) have many advantages over other types of



bins. Complete information is given in our folder, "Bins With the Strength of Pillars." Ask for a copy.

THE NEFF & FRY CO. • 166 Elm St., Camden, Ohio

NEFF & FRY ➔ **SUPER-CONCRETE STAVE STORAGE BINS**

When inquiring check CP 3543 on handy form, pgs. 2-3

| | | |
|--|--------------------------------|-----------------------------|
| <p>Tractor Model KT</p> | <p>Platform Model KN-KW</p> | <p>Tin Plate Model KTP</p> |
| <p>HydroElectric LIFT TRUCKS For the Heavy Load • For the Light Load • For the Unusual Load</p> <p>Look over the models illustrated. Some one of these trucks is adaptable to your needs. Whether you want to pull—push—carry or lift there is a model for every possible use. The many fleets of HYDROELECTRICS today carry products of every kind, shape and description are convincing evidence of their unusual application.</p> <p>Write today for FREE Catalog No. 35 featuring complete line of Lift Trucks.</p> | | |
| <p>High Lift—Model KHL</p> | <p>Rider tractor—Model KTR</p> | <p>Pallet—Model KPN-KPW</p> |
| <p>LIFT TRUCKS INCORPORATED</p> <p>2423-31 SPRING GROVE AVE. CINCINNATI 14, OHIO</p> | | |

When inquiring check CP 3544 on handy form, pgs. 2-3

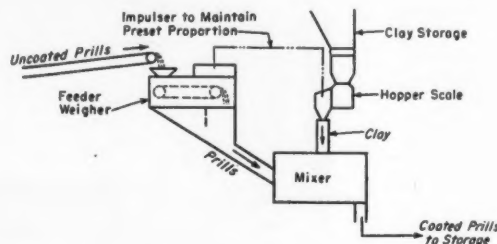
MATERIAL HANDLING

**Continuous and accurate blending
of additives to process material
uses automatic controls . . .**

system provides rigid process control, immediate start-up, and quick formula changing

Remote weight-control system has been developed for continuously and accurately blending additives with process material.

Features of system include batch-weighing of additives, continuous weighing of process material, and remote selection of weight ratios using single



dial control. Advantages are rigid process control, immediate start-up, quick formula changing, precise weighing of additives and operation over wide range of weight ratios.

Products handled include chemicals, foods, feeds, fertilizers, tobaccos, plastics, and cement and rock products. Components of system are automatic hopper scale, electric control system, control panel and constant-weight belt feeder.

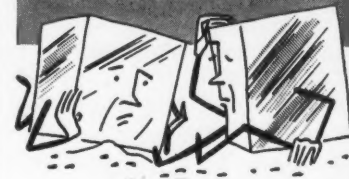
In operation, process material drops on belt feeder and discharges into mixer. Batches of additive are weighed out and automatically discharged into same mixer. Signal for discharge of additives is transmitted via impulser on belt feeder. Flow of material leaving belt feeder determines rate of additive discharge.

Typical system (see illustration) blends clay and prills. The clay serves as coating for prills to prevent them from sticking together. Weighing equipment consists of constant-weight, variable-speed feeder and a Glengarry Injecto-Weigh scale. Prills are fed continuously from belt conveyor to belt feeder, which automatically compensates for small changes in feed rate and density.

Action of feeder's weigh-beam opens and closes magnetic mercury switches that drive small control motor forward or reverse. Motor's action varies resistance in potentiometer that is geared to 3/4-hp variable-speed, DC drive motor. This causes drive motor to slow down or speed up.

Belt feeder can compensate for 10%/minute changes in weight of feed passing over it. For this operation, feeder has been set to hold 10 lb/ft of belt. Totalizing and reset counters record weight directly in pounds.

The case of the grounded ice cubes . . .



The operations of a Buffalo ice-making plant came to a costly impasse. Ice cubes were grounded for want of some way to unclog their transporting devices. Hammering was slow and often damaging to the equipment.

There was a solution, however, that solved the problem economically and swiftly . . . a **CLEVELAND vibrator**.



Let us know about your grounded material, or ask for our detailed literature. Engineering recommendations without cost or obligation.

AIR and ELECTRIC



2706 Clinton Avenue • Cleveland 13, Ohio

When inquiring check CP 3545 on handy form, pgs. 2-3

CHEMICAL PROCESSING

MATERIAL HANDLING

Every half-pound of material discharging from feeder produces an impulse. After preset number of impulses the Glengarry discharges batch of clay. Up to 400 impulses may be received by scale before discharging.

Glengarry unit consists of inlet hopper, vibrating feed trough, and small weigh-hopper. Clay is fed to weigh-hopper by vibrating trough. Feed is automatically shut off when pre-set weight is reached.

Alarm sounds and light on control board flashes if Glengarry is feeding too slowly. Alarms also sound if Glengarry or belt feeder is weighing excessively heavy or light. This happens whenever errors exceed 3%.

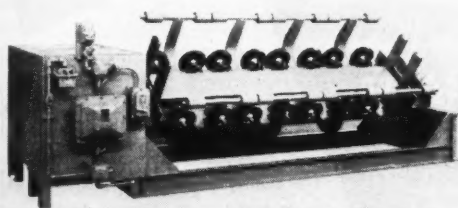
Panel control board contains stop-counter dials for selecting weight ratios, start and stop buttons, stop-counter, reset button, power-on light, system-running light, alarm reset and silencer buttons.

(E-20 Constant-Weight Feeder is a product of the Richardson Scale Co., Dept. CP, Van Houten Ave., Clifton, N. J. . . . or for more information check CP 3546 on handy form, pages 2 and 3.)

(Glengarry Injecto-Weigh scale is a product of Glengarry Equipment Corporation, Dept. CP, Bay Shore, N. Y. . . . or for more information check CP 3546A on handy form, pages 2 and 3.)

All internal surfaces of drums are scoured in reconditioner using chains and solution

Internal drum chainer rotates and oscillates drums so all internal surfaces are completely chained. Drums can be loaded manually from either side of machine by placing drums on revolving wheels when carriage is at maximum angular position. After chaining is completed, drums can be removed manually in like manner.



Four drums can be scoured at one time

Machine is complete, including welded structural steel frame, necessary rocking mechanism, two motors and controls. Models range from two to eight drum capacity.

(Drum Chainer is a product of the L. M. Gilbert Co., Dept. CP, 516 Drexel Bldg., Philadelphia 6, Pa. Check CP 3547, pages 2 and 3.)

HOW



LO-VEYORS

do more than simply convey

Ajax Lo-Veyors provide a self-contained conveying unit ready to set in place and use. They can be installed at or below floor level or suspended from walls or ceiling. They are actuated by the Ajax-Shaler Shaker, a fully enclosed, vibrating drive unit which eliminates exposed bearings, idlers and tail pulleys. They are ideal for use under normal as well as extreme conditions involving moisture, corrosion and abrasive-laden atmospheres.

They are being used with outstanding success and economy by the Who's Who of American Industry

Write giving complete information about your specific requirements.



Showing typical pan-type Ajax Lo-Veyor. Note extremely low head room required.



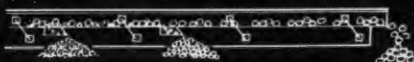
COOL WHILE CONVEYING

Water cooled pans reduce temperature of materials while being conveyed from ovens, molds, and other processing equipment



EXPLOSION-PROOF WHILE CONVEYING

Ajax closed pan and tubular Lo-Veyors are used where explosive materials are conveyed. Dust or gas-tight diaphragms convey through departmental walls.



SORT WHILE CONVEYING

Well adapted for separation of various sizes and types of materials. Grates and chutes can be arranged according to requirements.



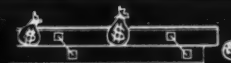
SAFEGUARD QUALITY WHILE CONVEYING

Fragile materials such as bulk candy, popcorn and cereals, are readily conveyed with reduced losses between manufacturing operations.



WASH WHILE CONVEYING

Waterproof pan and tubular Lo-Veyors made of standard and special materials permit use of various types of cleaning and treating solutions.



CUT COSTS WHILE CONVEYING

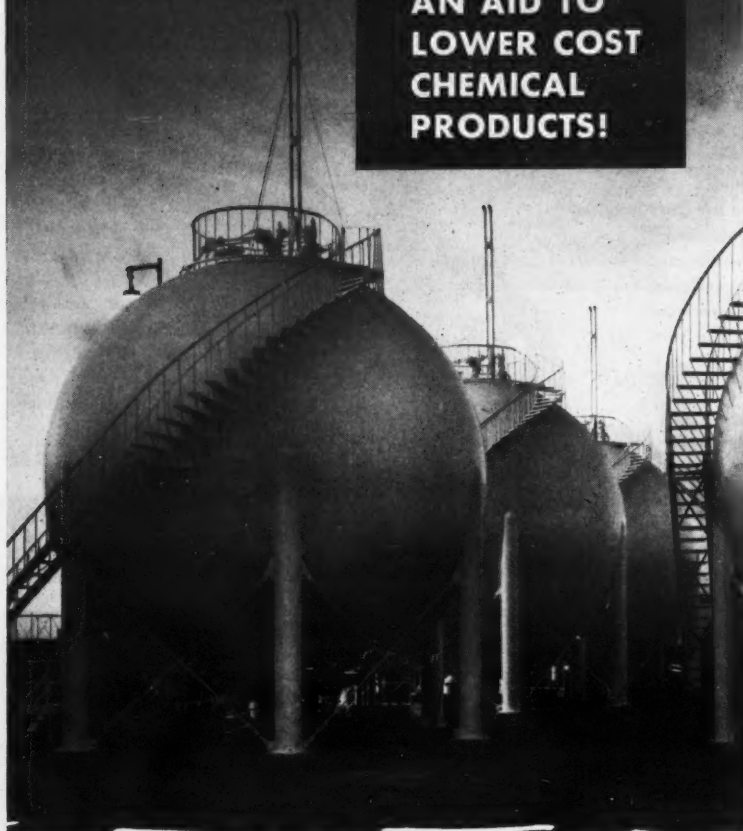
Reduce non-productive labor costs by moving raw, semi-finished and finished materials automatically. Low first cost, low power consumption and extreme low maintenance cost.

AJAX FLEXIBLE COUPLING CO. INC. WESTFIELD, N. Y.

When inquiring check CP 3548 on handy form, pgs. 2-3

HORTONSPHERES...

**AN AID TO
LOWER COST
CHEMICAL
PRODUCTS!**



2,320-bbl. Hortonspheres, designed for 150 lbs. per sq. in. working pressure, located at the Shell Chemical Company's Shell Point Plant near Pittsburg, California.

Hortonspheres®, like the 2,320-bbl. structures shown above, provide one of the most efficient methods known to man for the storage of anhydrous ammonia and other volatile chemicals. This great efficiency means lower cost chemical products for industrial and agricultural use.

Welded steel Hortonspheres are also widely used for the storage of most any type of volatile liquids or gases — wherever evaporation loss of the product is a problem. Hortonspheres are built in standard capacities up to 30,000-bbls. and for pressures to 217 lbs. per sq. in. in the smaller capacities. Write our nearest office for complete information, estimates or quotations on Hortonspheres.

CHICAGO BRIDGE & IRON COMPANY

Atlanta 3 2107 Healey Bldg.
Birmingham 1 1533 North Fifth St.
Boston 10 1007-201 Devonshire St.
Chicago 4 2116 McCormick Bldg.
Cleveland 13 2212 Midland Bldg.
Detroit 26 1535 Lafayette Bldg.
Havana 402 Abreu Bldg.
Houston 2 2151 C & I Life Bldg.

Los Angeles 17 1536 General Petroleum Bldg.
New York 6 3314-165 Broadway Bldg.
Philadelphia 3 1650-1700 Walnut St., Bldg.
Pittsburgh 19 3208 Alcoa Bldg.
Salt Lake City 4 507 West 17th South St.
San Francisco 4 1545-200 Bush St.
Seattle 1 1307 Henry Bldg.
Tulsa 3 1649 Hunt Bldg.

Plants at BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA.

When inquiring check CP 3549 on handy form, pgs. 2-3

MATERIAL HANDLING

**Develops low capacity
load cell for tension
measuring**

Uses: For weighing or measuring static or dynamic loads electronically when used with instruments incorporating simple vacuum tube circuits.

Description: Five separate models have been added to SR-4 load cell line. Three type U-1 have capacities of 0-50, 0-100, and 0-200 lb. They measure both com-



Load cell weighs only 2 lb

pression and tension. Two type T-1 cells, designed for tension loads only, have ranges of 0-100 and 0-200 lb.

Type U-1 cells are 4" in diameter, 5-3/4" high and weigh 10 lb. Type T-1 are 2-1/8" in diameter, 3 1/2" high and weigh 2 lb.

(SR-4 Load Cells are a product of the Baldwin-Lima-Hamilton Corp., Dept. CP, 940 Simpson St., Philadelphia 42, Pa. . . or check CP 3550, pages 2 and 3.)

**Gives specs on lift truck
gripper attachments**

Illustrated four-page folder shows action photos and gives specifications on gripper arms.

"Gripper Arms" bulletin is issued by Rheem Manufacturing Co., Dept. CP, Box 3669, Philadelphia 25, Pa. Specify CP 3551, pages 2 and 3.

TRI-LOK safety steps



**"A
STRONG STEP
TO SAFETY"**

Each Tri-Lok step consists of a panel of Rectangular, Diagonal, or U-type Tri-Lok flooring in any desired width, length, depth, and bar spacing.

SAFE—checker plate nosing bars make each step stand out clearly. Abrasive edging also available.

CLEAN—clogless, rivetless Tri-Lok joint prevents accumulation of dirt, moisture, rust.

STRONG—added strength provided at maximum load contact by shape and rigidity of nosing bar.

Write today for bulletin PL-1103

DRAVO CORPORATION

National Distributor for the Tri-Lok Company
Dravo Building, Pittsburgh 22, Pennsylvania
Sales Representatives in Principal Cities



When inquiring check CP 3552 on handy form, pgs. 2-3

S-A Automatic

**TELLEVEL
BIN LEVEL
CONTROL**

**PRICED AS LOW AS
\$40.00**

FOR Aurora, Illinois
Plus low cost
installation. State
or local sales
tax extra

**Avoids
SPILLAGE
Saves
TIME AND
STORAGE
SPACE**

● Fill bins, tanks or hoppers to capacity with S-A Tellevel without danger of wasteful overflow. Tellevels near top or bottom or at several levels give completely automatic, fool-proof level control — start or stop conveyors, etc., or sound alarm. Normal, heavy duty and explosion-proof models.

STEPHENS-ADAMSON MFG. CO.
Standard Products Division
11 Ridgeway Ave., Aurora, Ill.
Please send me Bulletin 11-0 on Tellevel Controls.

Name
Company
Address
City Zone State

When inquiring check CP 3553 on handy form, pgs. 2-3

CHEMICAL PROCESSING

MATERIAL HANDLING

Contains 16 line drawings of pneumatic conveyor

Twelve-page bulletin contains 16 line drawings of typical installations of manufacturer's pneumatic conveying systems. Among the installations are plants using bagged lime and dolomite, carbon black, powdered metal, zinc dust, feed catalysts, rock salt and lime. Clearly labeled drawings, coupled with captions, explain material handling systems.

Bul 105 is issued by Convair, Inc., Dept. CP, 714 Brookline Road, Pittsburgh, Pa. When inquiring specify CP 3554 on handy form, pages 2 and 3.

Loads lifted vertically with platform hoist . . .

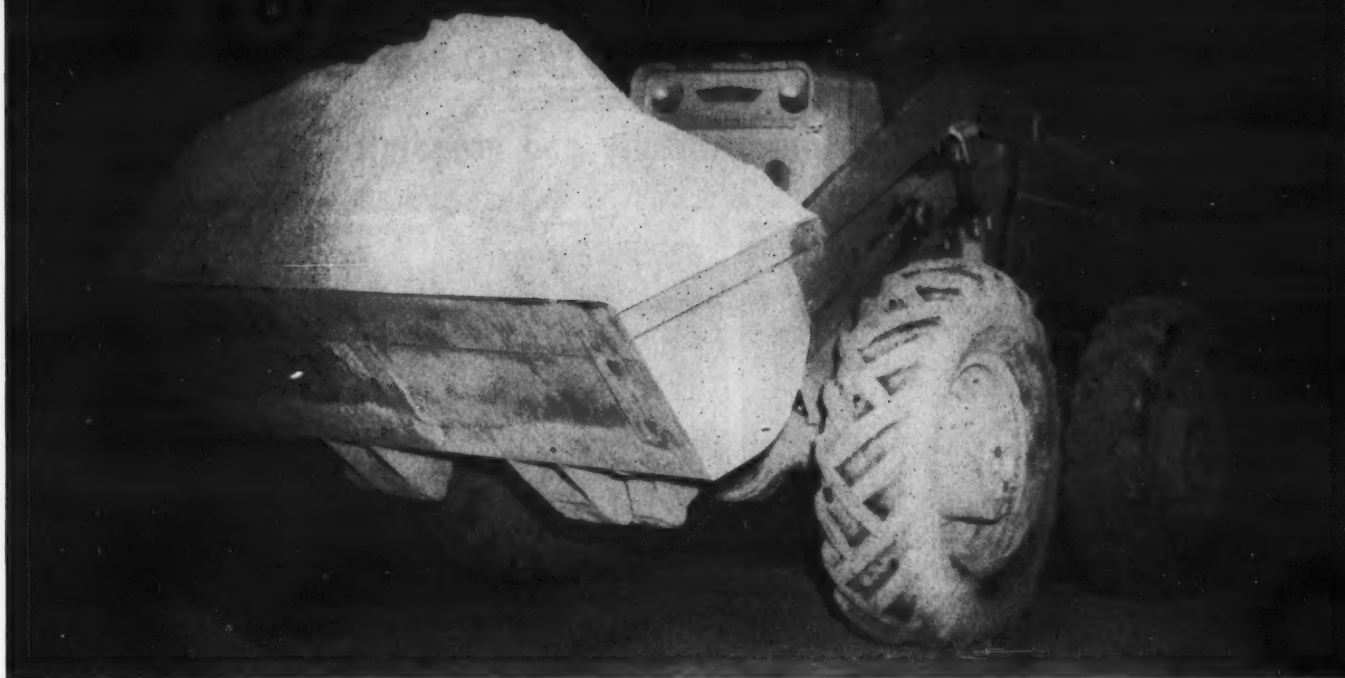
lift is furnished as complete package for installation

Vertical lift electric platform hoist moves goods vertically between floors or from one elevation to another. Unit is available with platform for use within one floor; with cab for mounting in hoistway for between-floors use; or equipped to operate between levels of conveyor systems. It comes as a complete package for installation.

Choice of lift speeds with either 250 or 500 lb capacity are available. Upper and lower limits of platform travel are adjusted by positioning micro switches on carriage frame. Maximum carriage travel is 20 ft.

(VL hoist is a product of the Rapids-Standard Co., Inc., Dept. CP, 342 Rapistan Building, Grand Rapids 2, Michigan . . . or for more information reader may simply check CP 3555 on convenient Reader Service slip located between pages 2 and 3.)

For more information on product at right, specify CP 3556 . . . see information, request blank between pages 2 - 3.



MICHIGAN *bucket control means* "Bigger LoadsFASTER"

Watch a MICHIGAN Tractor Shovel at work—with particular attention to bucket action—and you'll see how a MICHIGAN* will handle bigger loads, move more yardage—faster, at considerably lower cost.

- Tremendous break-out power—ram the cutting edge into any tough, hard-to-dig clay, shale or loose rock—and work the bucket to loosen it
- Bucket roll-back at ground level—pick up and transport full buckets at low center of gravity for safe traveling, no void space in the bucket; more work in less time
- Remarkable digging ability—two large double acting cylinders on bucket and two large double acting cylinders on main lift give excellent control and superior digging action.
- Good bucket height and reach—high dumping clearance and ample forward reach make trucks easy to load.

Check these outstanding Quality Features of MICHIGAN* Tractor Shovels . . .

1. Superior Bucket Action—bigger loads, faster loading
2. Clark Power-Shift Transmission—faster operating cycle gets more yardage
3. Clark Torque Converter—3-to-1 torque multiplication; power when needed—no conventional clutch
4. Clark Planetary Axle—relieves torque load on shafts and gears, prolongs machine life
5. Power Steering—much easier handling, lessens driver fatigue
6. Gas or Diesel—right power for the job; more horsepower than any comparable machine

Six models: capacities from 1.5 cubic feet to 2 1/4 cubic yards. Facts about the MICHIGAN Tractor Shovel are important—and interesting. The MICHIGAN Fact Folio contains specifications and action photos. The coupon gets it for you.

*A Trademark of Clark Equipment Company



CLARK EQUIPMENT

CLARK EQUIPMENT COMPANY
Construction Machinery Division
434 Second Street, Benton Harbor, Michigan
Please send the MICHIGAN Tractor Shovel Fact Folio

Name _____ Title _____

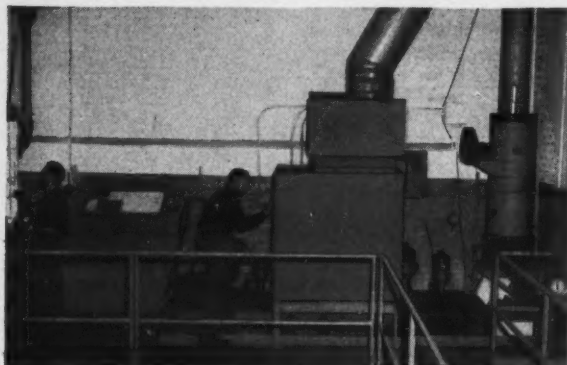
Firm _____

Address _____

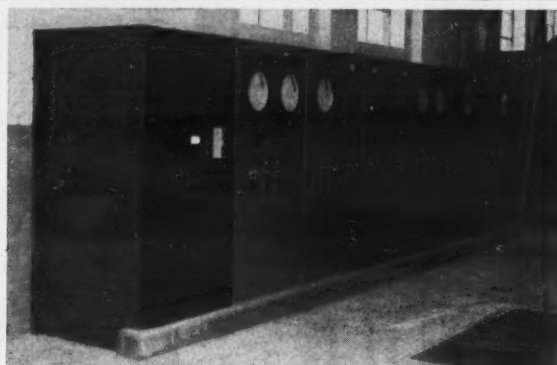
City _____ County _____ State _____

16A

At Gould Paper Co. **CONTINUOUS** Omega Feeders produce pulp bleach automatically and economically



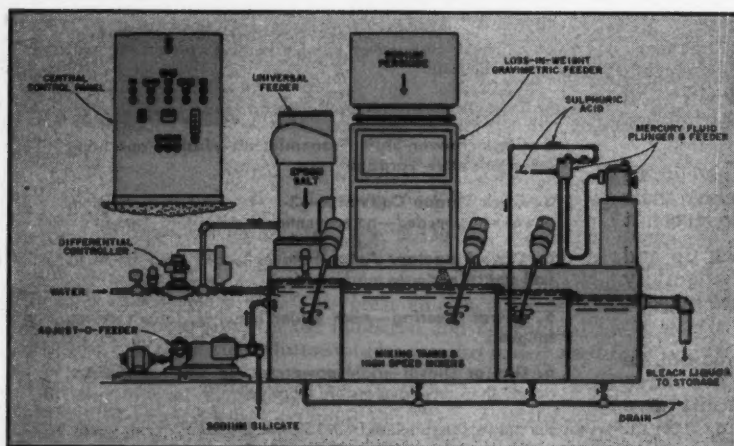
Omega Feeders in DuPont "Solozone" bleaching process at Gould Paper Co., Lyons Falls, N. Y.



Central control panel for peroxide bleaching at Gould Paper Co. Switch panel for Omega Feeders is at left.

Lyons Falls, N. Y.—This DuPont-developed "Solozone" sodium peroxide bleaching process uses Omega Feeders to proportion dry and liquid chemicals and water automatically for continuous preparation of the "Solozone" solution. This proportioning system, worked out by Omega in cooperation with the process engineers, provides the economies of continuous processing — reduced

space requirements, lower personnel costs, and consistent uniformity of output. Because of the high accuracy and wide adjustability of the Omega Feeders, the system maintains strict component proportions at all processing rates. Component ratios can be changed by manual feeder adjustments. The complete bleaching process is monitored from a central control panel.



CONTINUOUS BLEACH PREPARATION SYSTEM SUPPLIED BY OMEGA FOR GOULD PAPER CO.:

- Omega Differential Water Controller
- Omega Loss-In-Weight Gravimetric Feeder for sodium peroxide.
- Omega Universal Feeder for Epsom salt.
- Omega Central Control Panel.
- Omega mixing tanks, and high speed mixers.
- Proportioners (another division of B-I-F Industries) 2X5F Adjust-O-Feeder for Sodium silicate.
- Proportioners Model 2-47 Adjust-O-Feeder with mercury plungers for sulphuric acid.

MATERIAL HANDLING

Describes hydraulic truck for pallet handling

Circular of four pages describes and illustrates lightweight hydraulic pallet truck. Details of construction, engineering highlights, and installation photographs as well as complete specifications of 2000-lb capacity hand truck are included in brochure.

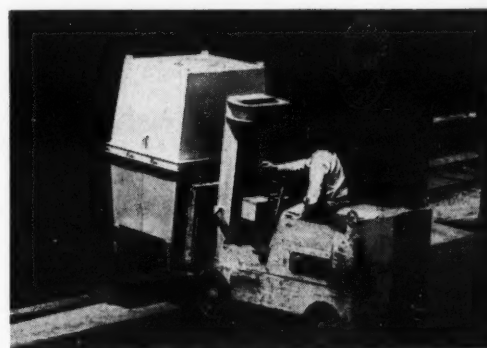
Circular 26A is issued by Dept. R-57, Lewis-Shepard Products, Inc., Dept. CP, 194 Walnut St., Watertown, Mass. When inquiring specify CP 3558 on handy form, pages 2 and 3.

Bulk material shipped safely in lightweight bin . . .

empty bins may be disassembled and placed one within the other for return shipment

Improved model aluminum bulk shipping container is now in volume production at Willys Motors, Inc., San Leandro, California plant.

Empty bins may be disassembled and placed one within the other, similar to nesting of paper cups.



Standard freight car holds 22 loaded bins or 308 disassembled bins

Three components make up unit — two tapered rectangular halves to contain material being shipped, and four-legged base.

Initial production is of three standard sizes which hold 63, 70, or 77 cu ft of dry commodities. Bin, measuring 42 x 53 inches at its center, varies in overall height from 5 feet 10 inches to 6 feet 10 inches and weighs from 175 to 195 pounds, depending upon capacity.

Standard 32-foot trailer will hold 14 loaded bins and up to 170 nested empty bins, while 22 full and up to 308 disassembled containers may be loaded in standard freight car.

The container is easily handled with standard fork lift, pallet truck, or overhead crane. When empty, bins may be assembled, disassembled and nested

May we help with your continuous chemical feeding operations? Send coupon, today, for details . . .

OMEGA THE LAST WORD IN FEEDERS
DIVISION OF B-I-F INDUSTRIES, INC.

OMEGA MACHINE COMPANY, 357L Harris Ave., Prov. 1, R. I.

☐ Send Bulletins 30-H12 and 20-J10 describing Omega Loss-in-Weight and Universal Feeders.

Name

Company

Street

City State

Our chemical feeding problem involves

When inquiring check CP 3557 on handy fom, pgs. 2-3

MATERIAL HANDLING

by hand. Bin sections are clamped together by fasteners designed for maximum speed of operation, and safety locking devices prevent accidental opening.

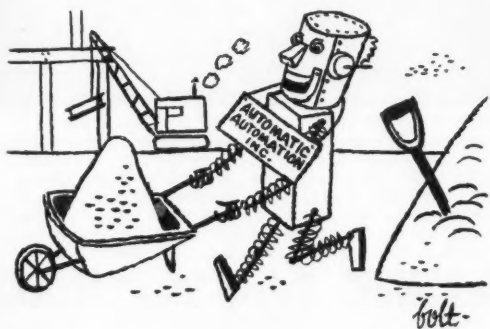
Container is filled from top and emptied from bottom through circular doors. Products subject



Aluminum container can be nested by hand

to contamination, deterioration or damage from elements are completely protected in bins, which are hermetically sealed around all openings by non-toxic, plastic gaskets.

(Nest-A-Bins are a product of Kaiser Nest-A-Bin Div., Willys Motors, Inc., Dept. CP, 880 Doolittle Drive, San Leandro, California . . . or for more information reader may simply check CP 3559 on the convenient Reader Service slip which is located between pages two and three.)



Does your plant need modern material handling methods . . . ?

check the handy Product Directory (pages 213 to 216) for a quick reference to ideas and equipment in this issue.



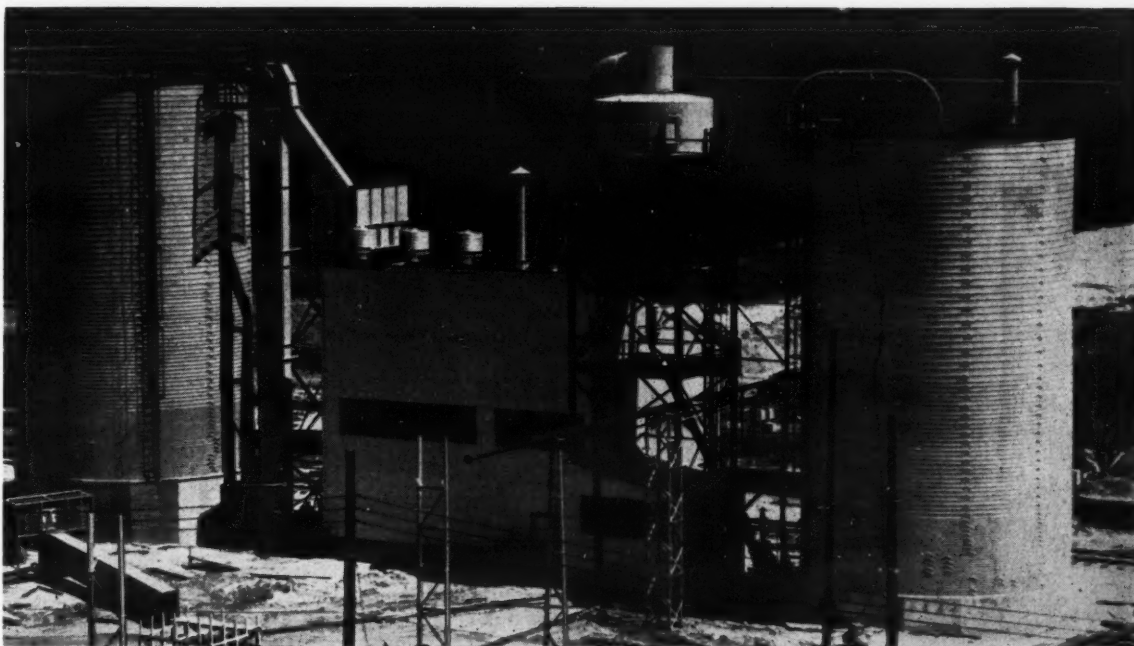
MARIETTA Concrete Silos and Storage Systems are designed to meet the specific needs of diversified industries. A permanent MARIETTA storage system, although geared for the future with built-in design flexibility, is capable of meeting industry's ever-increasing demands.

MARIETTA gives you large capacity storage for efficient, economical materials-handling and eliminates the need for drawing from ground storage.

**helps you
KEEP PACE
with the
increasing
demands of
industry!**

There is no limit to the equipment that can be incorporated into a MARIETTA silo wall, floor or roof. Design flexibility is a fundamental feature purposely engineered into all MARIETTA Silos to provide for any efficient discharge or servicing system.

To improve handling facilities, help build reserves, lower your operating costs and keep pace with increasing demands . . . write MARIETTA for complete information. Catalog available upon request.



A modern industrial storage system especially designed and erected by Marietta. Texas City Chemical Co., Texas City, Texas.

THE

Marietta

CONCRETE CORPORATION

MARIETTA, OHIO

BRANCH OFFICES:

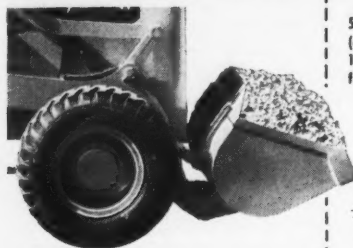
501 Fifth Ave., New York 17, N. Y.
Polaski Hwy. at Race Rd., Baltimore 21, Md.
805 Bessemer Bldg., Pittsburgh 22, Pa.
Nashville, Tenn.
Charlotte, N. C.
Hollywood, Fla.

When inquiring check CP 3560 on handy form, pgs. 2-3

SPEED 1-MAN HANDLING in plant, yard or box car

Jaeger Auto-Scoop moves a bigger load, turns shorter, carries faster, can dump higher and farther than comparable 12 cu. ft. scoop loaders. Lowest bucket tilt-back makes possible an always full bucket and lower carry. Simple controls, hydraulic functioning. Write for Catalog L12-4.

JAEGER LOAD-PLUS



Low level bucket tilt-back permits full bucket loading, better carrying.

Also available in 1 yd. capacity, with torque converter and power steering, for handling heavier loads to 5000 lbs; 2-wheel or 4-wheel drive.

THE JAEGER MACHINE COMPANY
616 Dublin Avenue — Columbus 16, Ohio

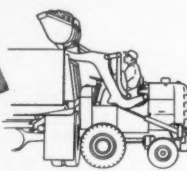
When inquiring check CP 3561 on handy form, pgs. 2-3



20% more lifting capacity (1200 lbs.).



5" shorter turning radius (6'6"). Faster speeds to 13.88 mph in reverse, 7.66 forward.



Higher clearance (6'8"), more reach (2'7").

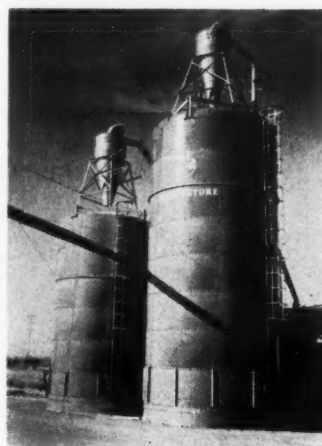
MATERIAL HANDLING

Hard-to-handle chemicals stored in glass-surfaced steel storage structure

Uses: For storing hard-to-handle materials such as sawdust, ground cork, dried milk, rice hulls and various chemicals.

Features: Structure can be furnished with breather system of twin vinyl plastic bags in top and vented to outside air.

Description: Storage structure is made of curved steel plate sections which have layer of glass fused on both sides. Furnished in



Glass-surfaced storage structures

diameters of 14, 17 and 20 ft and in seven heights from 20 to 50 ft., units have capacities of 2500 to 14,000 cu ft.

(Harvestore structure is a product of A. O. Smith Corp., Dept. CP, 3533 N. 27th St., Milwaukee, Wis. Check CP 3563, pages 2 and 3.)

Strain gage load cells on platform scale

Illustrated in two colors, catalog explains weighing scale which uses strain gage load cells and pneumatic-tare electrical weighing.

Cat 20 is issued by Weighing Components, Inc., Dept. CP, 64 Fulmor Ave., Hatboro, Pa. Specify CP 3564, pages 2 and 3.

"LIQUIDS WORTH STORING
ARE WORTH
MEASURING"
with a



- FOR GAUGING LIQUIDS OF ALL KINDS
- 100% AUTOMATIC
- APPROVED BY UNDERWRITERS' LABORATORIES

WRITE FOR COMPLETE DETAILS

THE LIQUIDOMETER CORP
38-18 SKILLMAN AVE., LONG ISLAND CITY, N.Y.

When inquiring check CP 3565 on handy form, pgs. 2-3

CHOOSE FROM 115 MODELS TO MEET YOUR EXACT NEEDS!



Only Ballymore ROLL-OR-GRIP all-welded-steel ladders assure you of just the right portable safety stair for each need. A standard size range from one to twelve steps; a choice of three safety treads (expanded steel lath, steel grip-strut, or rubber-clad steel plate); optional hinged shelves or removable baskets; and a wide choice of widths within each size—these extras add convenience to the superior safety features built into every Ballymore—the original—safety-step ladder.

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Investigate How Loading Dock Shelters Can Save Money For You

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When inquiring check CP 3562 on handy form pgs. 2-3

MATERIAL HANDLING

**Lifts, transports, dumps
barrels in close
quarters . . .**

handles any size or design to 1800-lb capacity

Uses: Handling and dumping barrels.

Features: Truck can accommodate barrels of any size or design. "Walkie" operation allows maneuverability in close quarters, gets barrel close to vat, hopper, etc, receiving material.



Operates in minimum space

Description: Barrel Dumper has a lift capacity of 1800 lb, lift height to four ft. Overall size is 44 x 75". Four-point load suspension gives good stability. Chain clamp on side of unit is adjustable to height of barrel being dumped. Truck speed is 2½-3 mph, with two speeds for forward and backward movement.

(Barrel Dumper lift truck is a product of Moto-Truc Co., Dept. CP, 1948 E. 59th St., Cleveland 3, Ohio. Check CP 3567, pages 2 and 3.)

Describes recording systems for automatic scales

Illustrated technical reference describes indicating and recording systems for use with manufacturer's automatic scales.

Tech Ref 53J is available from Richardson Scale Co., Dept. CP, Van Houten Ave., Clifton, N. J. Check CP 3568, pages 2 and 3.

CONTINUOUS, CONTROLLED COOLING BY SANDVIK STEEL BELT COOLERS is part of this success story*

This installation spotlights one of the basic advantages of Sandvik's water-bed unit... *control of cooling rate.*

Sandvik's patented design "floats" the solid steel belt on a trough of water. The trough is sectionalized into separate tanks. Coolant in these tanks can be maintained at different temperature levels to suit the cooling rate required.

Some other processing advantages include:

- Can be engineered to cool and convey, regulate thickness and temperature while cooling; obtain desired sizes in same operation; cool solids in sheet or granular form or crystallize liquids.
- Horizontal cooling surface permits depositing material in various thicknesses.
- Belts can be fitted with stationary or movable retaining side skirts.
- Solid, cold-rolled stainless or carbon steel belts provide a smooth, hard, impervious surface.

Would a Sandvik unit improve your processing? Write, wire or phone.

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Division of Sandvik Steel, Inc.

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SS-101



SANDVIK
STEEL
BELT
CONVEYORS



Commercial Solvents ran first cooling tests on an experimental unit like this, loaned by Sandvik.

Four Sandvik Steel Belt Coolers in operation in Commercial Solvents Corporation's new "straight-line" ammonium nitrate plant at Sterlington, La.

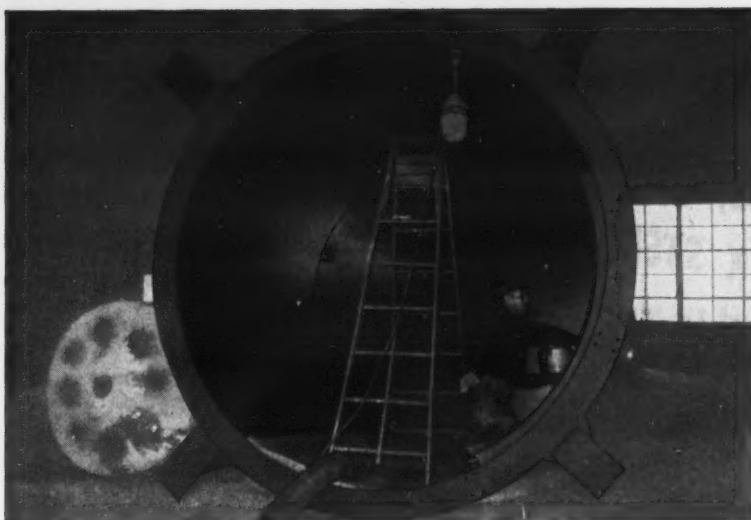
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COMMERCIAL SOLVENTS PATENTED
SHORT-CUT TO AMMONIUM NITRATE
ELIMINATES EVAPORATION AND
PRILLING—STERLINGTON, LA.
PLANT DELIVERS 200 TONS PER DAY

Ammonia and nitric acid react directly at 400 degrees F. to yield molten nitrate, which is cooled to solid form on Sandvik belts, broken up at take-off and then crushed.

*Reprints of CHEMICAL WEEK article describing this installation and process, available from SANDVIK on request.

At take-off end of Sandvik Cooler a breaker attachment breaks ammonium nitrate sheet into conveyable chips.

When inquiring check CP 3569 on handy form, pgs. 2-3



NOW...VYFLEX L-10 FLEXIBLE LINING

Stops Corrosion...Takes Hard Wear

Kaykor Vyflex L-10 is a new solution to your old corrosion problems. Based on Polyvinyl Chloride resins it provides the broadest range of corrosion resistance—withstands the toughest kind of abrasion and mechanical abuse—is far easier to apply.

Vyflex L-10 resists acids, alkalis, salts, plating solutions, and organic compounds at temperatures up to 160°F. Even protects your equipment and parts against oxidizing acids like chromic, nitric, and phosphoric, and highly concentrated, strong alkalis.

Vyflex L-10 provides an unparalleled combination of physical properties, too. Because it is inherently elastic, thermal expansion and contraction will not crack L-10, and the effects of mechanical abuse will be minimized. Good insulating properties mean no current loss from L-10 lined vessels in electrolytic reactions. And the inherently smooth, highly polished surface of L-10 simplifies cleaning, speeds solution flow, and provides superior abrasion resistance. The material is available both black and white.

L-10 IS EASIER TO APPLY. Introduction of L-10 means that lining can now be accomplished in the field as well as in the shop... accomplished in less time. Whether applied to steel, wood, or concrete, no curing is required. Qualified and experienced lining facilities are available through the greater part of the country.

GET THE FACTS! The complete story on Vyflex L-10 is provided in "Facts You Should Have On Vyflex L-10" and Engineering Bulletin L-10. Write Kaykor Industries for your free copies. Kaykor will also be happy to send you complete information on other Vyflex products, including F-92 Unplasticized Polyvinyl Chloride plate, sheeting, pipe, duct, and fittings; "G" (rubber-resin blend) sheet and plate; and Polyethylene sheet and plate.

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When inquiring check CP 3570 on handy form, pgs. 2-3

briefs

from contemporary publications

Activated silica: use and preparation

The main raw material in the batch or continuous preparation of activated silica is sodium silicate, in which alkali is wholly or partly neutralized. Water treatment plants can be increased in capacity and better water can result from the use of activated silica. Four pages, one photograph, one reference. ("Journal of the American Waterworks Association," June, 1954, page 571.)

Accuracy and precision of analytical procedures

A plan for determining the accuracy and precision of an analytical procedure is illustrated and discussed. Statistical principles are employed. Nine pages, 9 tables, 4 figures, 16 references. ("Analytical Chemistry," July, 1954, page 1102.)

How to color butyl rubber

This discussion deals with processing, extrusion, compounding, use of paraffin, acceleration, vulcanizing agents, loading, temperature of vulcanization, type of butyl rubber, and suggested recipes. Seven pages, 9 tables, 4 references. ("Rubber Age," June, 1954, page 389.)

Determining alcohol in breath and blood

Acidified permanganate is used in an "Intoximeter" to determine alcohol in the breath. Alcohol in blood can be estimated from the content of carbon dioxide. Three pages, one figure. ("Journal of Chemical Education," July, 1954, page 380.)

Synthetic detergents and water supplies

Effects of synthetic detergents on water supplies are considered. Chemical and physical behavior, analytical methods, toxicity, and effects on treatment of water and sewage are covered. Twenty-four pages, 9 figures, 6 tables, 62 references. ("Journal of the American Water Works Association, August, 1954, page 751.)

Plastic tools

Plastic tools for metal working are discussed under the headings of economics, reinforced plastics, impregnated materials, tooling, stability, and dies. Thirteen pages, 33 figures. ("Modern Plastics," September, 1954, page 85.)

Crystallization

From England comes this survey, which covers crystal growth, fractional crystallization, additives, equilibria, and industrial practice. This paper is slanted toward production of sodium sulfate, nitrogenous salts, potash, and sugar. Three pages, 77 references. ("Chemical and Process Engineering," August, 1954, page 235.)

Oxygen uptake

Instruments are described for measuring the rate at which bacteria are metabolized in an activated sludge. Determinations of oxidation-reduction potential are made in a sealed Erlenmeyer flask. Results from three waste treatment plants are included. Two pages, 4 figures. ("Instrument and Automation," August, 1954, page 1312.)

Synthetic detergents in sewage

Synthetic detergents in sewage can be determined by means of a volumetric method that is not affected by thiocyanates, nitrates, nitrites, sodium chloride, and sodium sulfate. Nine pages, 9 figures, 2 tables, 8 references. ("Sewage and Industrial Wastes," August 1954, page 945.)

How to reduce post-fire water damage

Photographs and directions show how to mark valves and their locations so that water to sprinkler lines can be cut off quickly after a fire has been extinguished. Two pages, 2 figures, 4 photographs. ("Southern Power and Industry," August, 1954, page 62.)

Coloring plastics

Four papers are devoted to the coloring of styrene, polyethylene, and vinyls. Processing methods, colorants, dispersibility, quality control, performance of colorants, pigments, stabilizers, and applications are covered. Ten pages, 2 figures, 3 tables, 5 photographs. ("Modern Plastics," August, 1954, p. 99.)

Assay of meat

The determination of hydroxyproline as an index of connective tissue in meat muscle is discussed. Determinations of collagen and elastin are included. Five pages, 5 figures, one table, 15 references. ("Agricultural and Food Chemistry," August, 1954, page 878.)

Paper from straw and bagasse

From England comes a survey of straw and bagasse as papermaking materials. Coverage includes bagasse newsprint, suitability of straw pulp, the celeror process, and economic aspects. Four pages, one figure, 5 photographs. ("Fibres," July, 1954, page 219.)

Liquid-liquid extractor

Operating characteristics and design of a new mixer settler for liquid-liquid counter-current extraction are presented. Results of a trial with the system: methyl isobutylketone — water — acetic acid are given. Six pages, 8 figures, 3 tables. ("Chemical Engineering Progress," August, 1954, page 403.)

Proportioning systems

Continuous gravimetric proportioning systems are discussed under the headings of loss-in-weight designs, belt-type feeders, and electronic load cells. Six pages, 12 figures. ("Mechanical Engineering," August, 1954, page 653.)

Antibiotic fermentation

A British biochemical engineer discusses the growing importance of microbiological processes in chemical industry and the attendant problems. Six pages, one figure, 16 references. ("Research," August, 1954, page 295.)

Dimensional stabilization of paper

This investigation of methods for dimensionally stabilizing paper covers effects of basis weight, freeness, heat, beater addition of clay, silicone and rosin sizes, neoprene, thermosetting resins, and urea. Eleven pages, 17 tables, 11 figures, 37 references. ("Tappi," August, 1954, page 321.)

Titration by photometry

Advantages and applications of photometric titrations are considered. Attention is accorded acid-base titrations, oxidation-reduction titration, turbidimetric titrations, and those involving complex formations. Four pages, 3 figures, 20 references. ("Journal of Chemical Education," August, 1954, page 394.)

More tank heating for LESS MONEY!

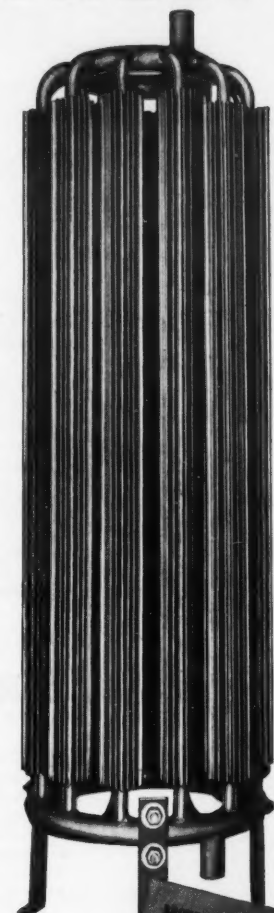
CUT YOUR TANK HEATING COSTS WITH BROWN FINTUBE TF-18 TANK HEATERS

• Users report that our vertically mounted TF-18 Tank Heaters cost less including the installation than just installing old fashioned bare pipe coils in the bottom of a tank. Also, the vertical mounting prevents sediment from settling on the heating surfaces as when the old fashioned coil is used. This means more efficient, less costly heating. It avoids heating through a layer of sediment and leaves the tank floor uncluttered and easy to clean.

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ON OPERATIONS
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LIKE THESE . . .

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Still, etc.

Higher combustion efficiencies
at lower fuel costs

PROCESSING

Air Liquifraction . . . Processing Buta-
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Better product quality with
minimum oxygen or air con-
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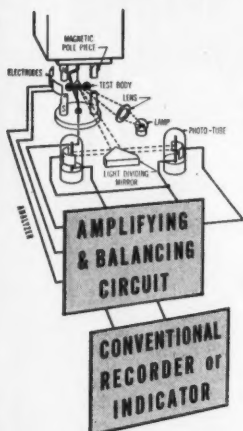
Control explosive atmospheres,
reduce fire risks, minimize
plant and personnel hazards

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Resin Kettles, Color Pigments, Product
Storage, etc.

Reduce oxidation, maintain
product standards with con-
trolled purge systems

with **Arnold O. Beckman Oxygen Analyzers**



MANY RANGES

MODEL F . . . ranges of 0-5%, 0-10%,
0-15% O₂ and higher. Accuracies as
high as .05% O₂.

MODEL G . . . for O₂ concentrations
as low as 0-1000 ppm—as high as
95-100% O₂. Accuracies to 40 ppm.

Multi-Ranges Are Also Available.

The various applications highlighted above are only a few of the many ways Arnold O. Beckman Oxygen Analyzers—industry's great new profit builders—are being used by progressive operators to boost profits, cut costs.

These are the *only* oxygen analyzers that continuously measure process streams by an advanced magnetic principle that provides *direct physical measurement* of the oxygen itself—not of some secondary relationship.

Heart of the unit, as illustrated, is a dumbbell-shaped test body suspended in a magnetic field. Sample gas surrounding this test body causes it to rotate in the field, depending upon the oxygen content of the gas. The movement of a light beam, reflected by a small mirror on the test body, is measured by simple electronic circuits . . . and the result indicated directly on a conventional recorder or indicator. It's simple, positive, accurate!

No chemicals—filaments—catalysts
cans—complicated mechanical parts!

Send for **Helpful Free Literature** which describes this unique operating principle in detail—explains its many advantages and applications. When writing, outline your particular operations—we'll gladly supply specific applications.

Arnold O. Beckman INC.

1020 MISSION STREET, SOUTH PASADENA 4, CALIF.

When inquiring check CP 3572 on handy form, pgs. 2-3

for the laboratory



Paschke shows swirling motion of liquid fatty acids in the flask in a typical laboratory distillation. Equipment being swirled includes single neck, round-bottom flask with thermometer — heated by electric mantle. Also being swirled, but not shown, is a Vigreux fractionating column and a distillation head

General Mills research chemist R. F. Paschke, who developed laboratory time-saver, shows how to make . . .

flask swirler from stock room parts

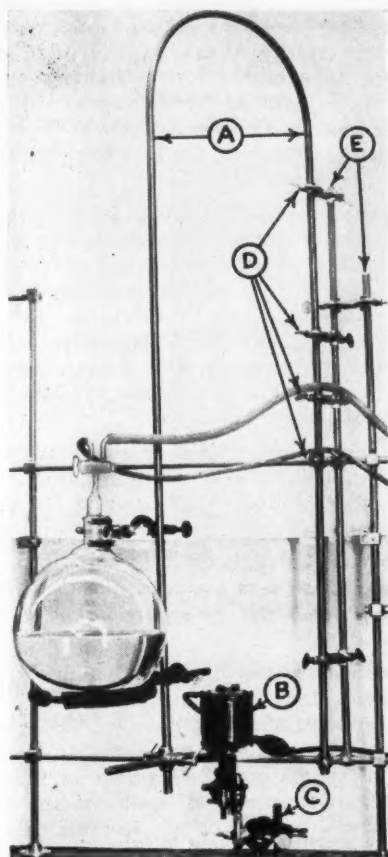
Versatile laboratory arm replaces hard stirrers and specialized agitators

Two research chemists at General Mills research laboratories have come up with a design for an easy-to-make flask swirler. Components for this swirler can be found in almost any laboratory and in the words of the "Do-It-Yourself" manuals, even a child can construct the unit. Called the Paschke Swirler, the laboratory is the brain child of R. F. Paschke and D. H. Wheeler.

To make a Paschke Swirler, bend a nine ft length of $\frac{1}{2}$ " stainless steel rod into inverted "U". Radius of bend is 6 or 7" in center with arms of approximately equal length.

Fasten one arm of "U" rod firmly to distillation rack at three or four points. This arm acts as the anchoring body. The other arm takes the place of arm and wrist. It is free to oscillate in any direction.

Stirring motor with a weighted eccentric attached on the short motor drive shaft is mounted at bottom of free arm. As eccen-



Simple setup for swirler includes the "U" arms (A), motor (B), eccentric (C), clamps (D), distillation rack (E)

tric weight revolves, entire free arm is given a swirling motion.

Control of motor speed with variable transformer or rheostat is unsatisfactory due to fluctuations in motor speed. Motor with a variable cone drive is more dependable. Eccentric consists of a short rod mounted horizontally to a drive shaft.

One or two laboratory clamp holders mounted on one end of this horizontal rod give desired eccentric effect. Motor weight plus any charge being swirled causes the free arm to sag. Therefore, the "U" bend should be less than 180 degrees so the loaded arm will approach an approximately vertical position when at rest.

Flasks to be swirled are mounted on this free arm. Simple change of eccentric rpm is enough to adjust the swirling motion to the natural frequency of any particular size flask from a few milliliters to five liters. It is seldom necessary to change the position of mass of weighted eccentric.

The Paschke Swirler has been used for flasks up

(Continued on next page)

DUAL-PURPOSE 12" CENTRIFUGAL

for
lab tests . . .
and small batch production



In lab work, the Tolhurst Laboratory Centrifugal will help you determine the most efficient procedure for centrifuging different materials. In production, you can put this 12" Tolhurst to work centrifuging small quantities of fine chemicals or pharmaceuticals. This machine economically handles small batches and frees your larger machines for other work.

Constructed on the patented "Center-Slung"® principle, this machine handles unbalanced or liquid loads smoothly and safely. The "Center-Slung" design in-

sures uniform extraction, relieves bearing stress, reduces friction and minimizes vibration.

You have a choice of 3-speed motor drive or "all-speed" hydraulic drive. Baskets can be perforate or imperforate. Baskets and liners can be constructed of corrosion-resistant metals or with protective linings. The machine is available with or without cover. For new illustrated catalog, mail coupon now.

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TOLHURST CENTRIFUGALS DIVISION, Dept. CP-1154
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When inquiring check CP 3573 on handy form, pgs. 2-3



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**CHEMICALLY RESISTANT
JARS, POTS
CROCKS, TANKS**

**Insist On
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CHEMICAL
PORCELAIN**

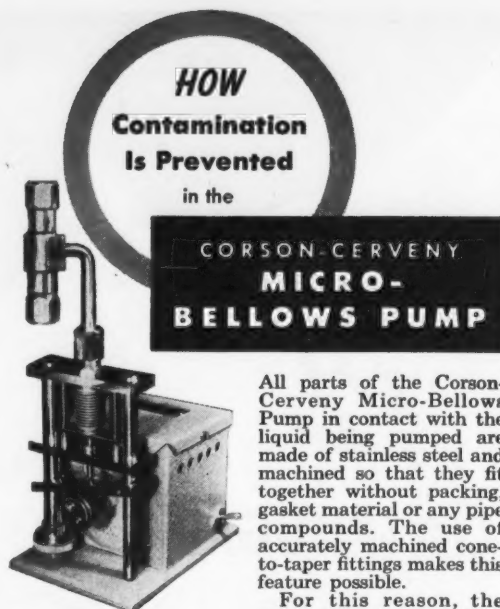
Jars, pots, tanks, etc. made from "U.S." Chemical Porcelain are leak-proof, mechanically strong, dense and of virtual zero porosity. They are completely inert to all chemicals except hydrofluoric acid and hot caustics. And porcelain contains *no iron* to be absorbed — no induced contamination! Its non-aging characteristics make for long, maintenance-free service life. No-seam construction, rounded corners and smooth lustrous white glazed surfaces provide for quick, easy cleaning.

Our complete Chemical Porcelain line of jars, pots and tanks includes a wide variety of stock items in capacities ranging from 2½ to 200 gals.

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U.S. STONEWARE Process Equipment
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**HOW
Contamination
Is Prevented**

in the

**CORSON-CERVENY
MICRO-
BELLOWS PUMP**

All parts of the Corson-Cerveny Micro-Bellows Pump in contact with the liquid being pumped are made of stainless steel and machined so that they fit together without packing, gasket material or any pipe compounds. The use of accurately machined cone-to-taper fittings makes this feature possible.

For this reason, the pump will not contaminate material that it is handling, and is adaptable for many specialized laboratory uses.

For full information about construction, capacity, performance, write for copy of Pump Booklet.

RESEARCH APPLIANCE COMPANY

Box 463, West View Road, Pittsburgh 9, Pa.

When inquiring check CP 3575 on handy form, pgs. 2-3

FOR THE LABORATORY

(Continued from preceding page)

to five liter capacity. As an example, for distillation purposes, flasks, heating mantle, fractionation column, fraction cutter and receiver are all swirled as a single unit. By contrast, as many as two dozen small flasks of the 25 cc size have been swirled on a single assembly.

Swirler was first used to agitate solutions during stripping of solvent with vacuum. Later, in work with polymerized fatty esters, it was found desirable to substitute the device for the usual stirrers during polymer analysis by distillation. This permitted use of single neck flask instead of the customary two or three neck flasks, eliminated problem of taring a stirrer blade and minimized chances of leaks.

Device also has been used to agitate solvents when difficulty-soluble materials are being dissolved. It has been used during esterification at room temperature of high melting unstable fatty acids since blanketing with an inert gas is then a simple matter.

With no moving parts connected with the chemical system, device is safe to operate for many hours unattended.

(Information courtesy of General Mills Research Laboratories, Dept. CP, 2010 E. Hennepin Ave., Minneapolis 13, Minnesota.)

Uses ion-exchange resin in tube to produce equivalent of triple-distilled water



Uses: For production of ion-free water for use in storage batteries, sterilizers and vaporizers, photographic work, ion-free rinsing of laboratory apparatus or other applications where mineral-free water is desirable.

Features: Filter containing ion-ex-

change resin may be easily replaced when it becomes exhausted. Unit is easy to use — a squeeze of bulb and raw water is drawn through filter, filling bulb. Water can be squeezed from bulb into container as needed.

Description: Demineralizer is 7¼" long with ¾" diameter tube. Bulb has diameter of 2½". Unit weighs 4 oz.

(MIN-X Unit is a product of LaMotte Chemical Products Co., Dept. CP, Towson 4, Baltimore, Md. Check CP 3577, pages 2 and 3).

Hotpack SAFETY OVENS

Designed for LAB SAFETY

SPECIFY



**CONTROLLED
TEMPERATURE
EQUIPMENT**

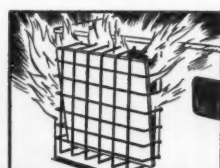
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Laboratory
Safety
Table Top
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ROOMS
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WATER BATHS
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INCUBATORS

OVENS are often required to dry or condition materials which have a high content of explosive vapors or a possibility of chemical reaction going out of control inside the oven.

A comprehensive report is available which discusses the safety hazards presented by typical laboratory ovens and the features incorporated to safeguard against fires and explosions and to shield and protect personnel using them, should an explosion or fire occur.



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CAN
HAPPEN**



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when you use a**

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SAFETY OVEN**

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5033 COTTMAN ST.**



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When inquiring check CP 3576 on handy form, pgs. 2-3

**Compact mass spectrometer
uses cycloidal-focusing
principle . . .**

unit permits quantitative separation of mass
2 through 150 — scanning to mass 180

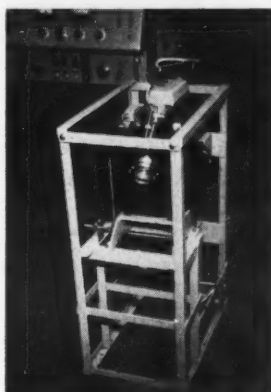
Uses: Designed for high speed analyses of gaseous and light liquid mixtures. As a continuous monitoring system, instrument may be coupled into process stream.

Features: Cycloidal focusing of ions depends upon ion mass and strength of crossed uniform electric and magnetic fields, and is independent of velocity or direction of motion of injected ions. This principle reduces size of instrument over previous models.

Description: Quantitative separation may be obtained from mass 2 through mass 150. Scanning is possible to mass 180. Spectra are presented on pen-and-ink recordings. Interference between peaks caused by distortion due to ion energy spread has been eliminated by independence of initial ion energies in cycloidal instrument.

Unit has built-in, supplementary 180-degree analyzer in cycloidal tube for making hydrogen determinations on an automatic basis without disturbing magnetic field. Complete cycloidal analyzer is demountable for cleaning and is self-aligning on reassembly. Filament replacement is accomplished quickly and conveniently without disturbing any other parts.

(Mod 21-620 Mass Spectrometer is a product of Consolidated Engineering Corp., Dept. CP, 300 N. Sierra Madre Villa, Pasadena 8, Calif. . . or for more information check CP 3578 on handy form, pages 2 and 3.)



Cycloidal focusing tube
may be removed for cleaning
and servicing

**Shows and describes 10 models
of serological water baths**

Illustrated eight-page catalog section shows 10 kinds of serological water baths and accessories.

Section 3, Catalog 100 is issued by Chicago Surgical and Electrical Co., Div. of Labline, Inc., Dept. CP, 217 N. Desplaines St., Chicago 6, Ill. Check CP 3579, pages 2 and 3.

NEW speed...accuracy...dependability...

in the measurement of percentage hydrogen in liquid hydrocarbons

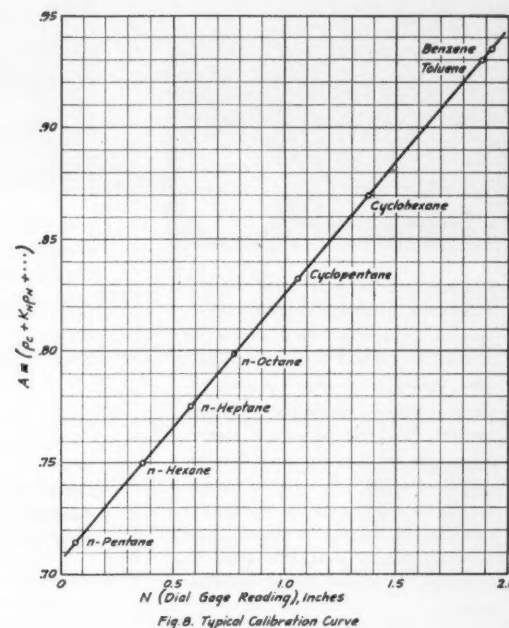
THE NEW CENCO[®] BETA RAY ^H/_C METER utilizes radioisotopes

Here is a practical, efficient precision instrument designed for use in research as well as in product control and routine analysis. It provides a fast, accurate means of measuring the percentage of hydrogen, or the hydrogen-carbon ratio, in liquid hydrocarbons.

- * Makes complete determination in 5 minutes
- * Accurate to within 0.02 weight percent hydrogen
- * Handles hydrocarbons ranging from normal pentane to 1,6-dimethylnaphthalene with no change in precision over the full range
- * Calibration is independent of pressure changes in ionization chambers since they share a common supply of gas
- * Temperature changes do not affect measurement since both specific gravity and beta absorption measurements are made automatically at same temperature
- * Twin beam instrument using single beta ray source is independent of source variations
- * Adequate shielding makes instrument safe from radiation hazards
- * Null-point balance is independent of electrometer variations

The New Cenco Beta Ray H/C Meter fills a long felt need in numerous petroleum processing operations . . . where the hydrogen-carbon ratio is altered . . . where the percentage of hydrogen is an index to the performance of end products such as jet fuels, fuel oils, gasolines, etc. Our Bulletin No. 115 contains full details about this precision instrument. Write for your copy today.

Exclusive manufacturing and sales rights for the Cenco Beta Ray H/C Meter have been assigned to Central Scientific Company by Standard Oil Company (Indiana).



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When inquiring check CP 3580 on handy form, pgs. 2-3

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When inquiring check CP 3581
on handy form, pgs. 2-3

FOR THE LABORATORY

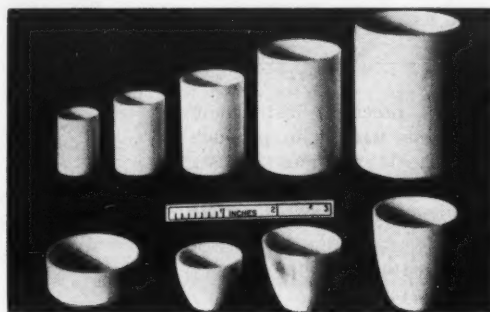
**Strongest reducing agents fail
to affect sintered alumina
laboratory crucibles . . .**

have unusual resistance to strong reducing agents, contamination and thermal shock

Uses: For melting nearly all metals and their alloys without fear of contamination of melt by the crucible.

Features: Crucibles are not affected by the strongest reducing agents. Even carbon and hydrocarbons at temperatures as high as 1700°C and hydrogen at 2050°C have no effect.

Description: Laboratory crucibles are fabricated of Kernal sintered alumina. Thin walls made pos-



sible by development of the special high density aluminum oxide ceramic material assure high resistance to thermal shock.

(Alumina Crucibles are a product of Palo Laboratory Supplies, Inc., Dept. CP, 81 Reade St., New York 7, N. Y. Check CP 3582, pages 2 and 3).

**Lucite-constructed apparatus
permits observation
of dialysis . . .**

unit has 1/250th capacity of production model
for solving pilot plant problems

Uses: Designed for research, classroom demonstrations, or pilot plant work, dialyser is used for recovery of soluble salts, removal or recovery of acids, separation of colloidal material from dispersions, or other problems where dialysis finds application.

Features: Laboratory model continuous dialyser is constructed of Lucite so process may be demonstrated and observed. Apparatus has 1/250th capacity of large production model making it suitable for pilot plant work and estimation of equipment needs for full-scale plants.

Description: Unit has thirteen rings between two ends. Between each two rings, membrane

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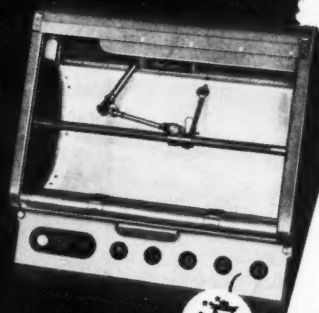
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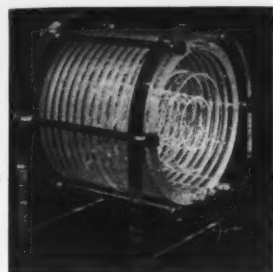
When inquiring check CP 3584 on handy form, pgs. 2-3

CHEMICAL PROCESSING

FOR THE LABORATORY

of either cellophane, parchment or other suitable material, is placed. Solution to be dialysed is fed into manifold at lower left-hand corner of unit.

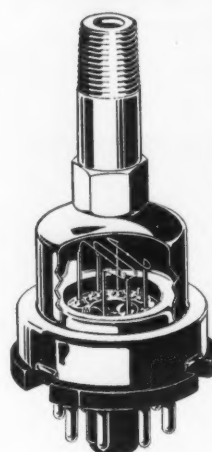
Dialysing liquid, usually water, enters manifold at upper left-hand corner of unit and flows into cells between those containing solution to be dialysed. Dialysing liquid flows in downward direction in cells and out through manifold at bottom of unit common to these cells. Principle of counter-flow through unit gives greatest possible potential across membranes at all times. Rates



Lucite construction permits observation and demonstration of dialysis

of flow of both the solution and dialysing liquid are kept constant by maintaining constant head over metering orifices throughout the entire run.

(Webcell Continuous Dialyser, Laboratory Model, is a product of Brosites Machine Company, Inc., Department CP, 50 Church Street, New York 7, New York . . . or for more information reader may simply check CP 3585 on the convenient Reader Service slip which is located between pages two and three.)



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withstand the vibration and shocks that ruin long wired gauge tubes. Elements are direct heated, reach operating temperature in less than one second.



New Hastings Vacuum Gauge Lasts 10 Times Longer

Short, direct heated elements can't be damaged by vibration or pressure changes

Here is a vacuum gauge that provides laboratory-type accuracy under industrial production conditions. Simple to operate. Dependable. Highly stable. Single knob control.

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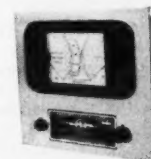
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For further information wire HICO Instrument Division, Hastings Instrument Company, Warwick 10, Virginia.

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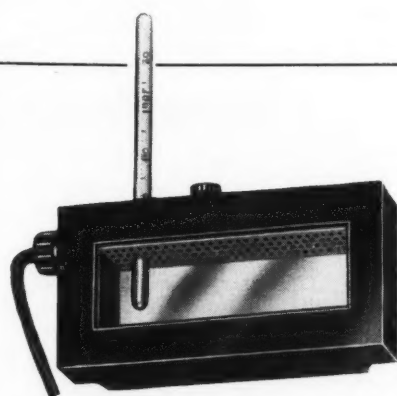
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When inquiring check CP 3587 on handy form, pgs. 2-3



Thermostatically-controlled warm stages keep microscope slides at incubation temperatures. Units are available for standard 3 x 1" glass slides or for immersion lenses. One model accommodates Maximow slides. All have built-in heating elements adjustable from 90 to 110°F.

(Models 57, 58 and 59 Warm Stages are available from Chicago Surgical & Electrical Co., Dept. CP, 217 N. Desplains St., Chicago 6, Ill. . . or for more information check CP 3586, pages 2 and 3.)

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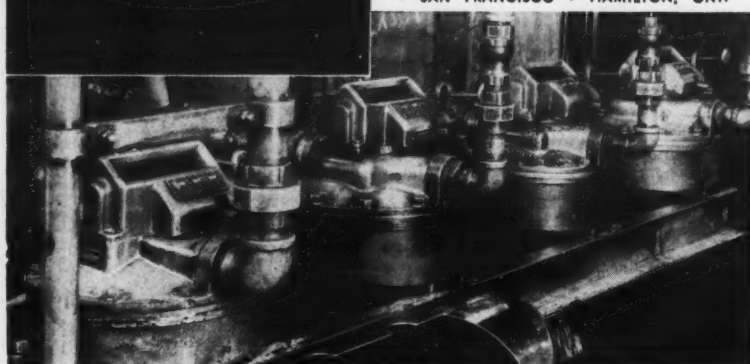
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Protection at LOW COST!

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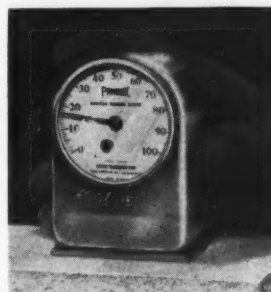
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FOR THE LABORATORY

Make fast, accurate readings of foam rubber hardness with portable tester...

rubber hardness gage fits in coat pocket,
weighs only 6 oz



Gage is pressed against
foam rubber specimen for
hardness determination

Uses: For measuring the hardness or resiliency of foam and sponge rubber and other soft elastomers.

Features: Measurements are fully reproducible and can be made within seconds. Instrument is hand-held and weighs only 6 oz.

Description: Instrument is placed on material to be measured and pressed down so base is flush with material surface. Indentor actuates indicator on dial. Values on scale are based on displacement of constant load of 250 gm over area of 1 cm. Readings are accurate on specimens with minimum thickness of ¾". Thin materials should be stacked to required thickness. Size of gage is 2¼" wide by 1⅞" deep by 3⅝" high.

(Model 302S Pandux Rubber Tester is a product of Pacific Transducer Corp., Dept. CP, 11921 W. Pico Blvd., Los Angeles 64, Calif. . . or for more information concerning manufacturer's product reader may simply check CP 3589A on the Convenient Reader Service slip which is located between pages two and three.)

Drift-free photofluorometer has three simple controls to adjust circuit...

automatic shutter protects samples from continuous exposure to UV light source

Uses: For analysis by fluorimetric method of such substances as vitamins, quinone, atabrine, fluorescein, porphyrins, steroids, metal complexes, and other similar compounds.

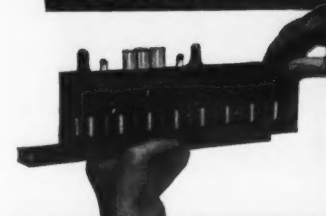
Features: Relative fluorescent intensities are indicated on direct-reading meter. Adjustable aperture and automatic shutter between light source and sample protects sample from intense UV illumination except when readings are made. Optical system permits only small area of sample to be exposed to UV beam.

Description: Photofluorometer is AC line-operated. Light for exciting fluorescence is obtained



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CHEMICAL PROCESSING



Requires only 8 ml of sample for fluorimetric analysis

from high-intensity AH-3 mercury vapor lamp. Sample fluorescence is observed through wide-angle collimating lens, by phototube located on an axis 90° to exciting beam.

Standard 19 mm round test tube cuvettes may be inserted directly into optical system. Instrument readings are independent of exact cuvette dimensions and only 8 ml of sample are required.

Measuring circuit is adjusted by three simple controls — coarse and fine blank controls and standardizing control for adjusting sensitivity of instrument to particular sample being measured. Electronic system (phototube, amplifier and power supply) is single, self-contained unit. Self-regulating lamp transformer levels out voltage fluctuations which could affect light output of mercury vapor lamp.

(Model 12C photofluorometer is a product of Coleman Instruments, Inc., Dept. CP, 318 Madison St., Maywood, Ill. Check CP 3591, pages 2 and 3.)



POWER-O-MATIC



A NEW PRINCIPLE IN
LABORATORY OVENS

HARSHAW SCIENTIFIC
announces the Blue M
"POWER-O-MATIC" ovens
with "Con-Wate"
mechanical convection

- ★ Fully automatic straight line control over entire range
- ★ Temperature range to 316°C. (600°F.)
- ★ Actual temperature control, plus or minus 1/2°C.
- ★ Automatic heat recovery

Power-O-Matic—a new heating system which achieves "straight line" temperatures through automatic wattage control. Heart of system is hydraulic type thermostat equipped with 5 contacts operating in sequence. Each contact works into a 6-volt relay which in turn applies power to 5 heater elements. When control unit is set at selected temperature, all heater elements are energized; as selected temperature is approached, heater elements are turned off one by one. To maintain selected temperature, minimum number of elements, usually one, will be switched on and off to compensate for heat losses and work-load heat absorption.

Con-Wate—a new mechanical convection system which provides constant weight of air at all temperatures. Normally, heat transfer decreases as air temperature in an oven increases. Con-Wate compensates for this by automatically providing increased supply of air. This results in constant heat transfer and more efficiency.

Construction—stainless steel interior; heavy gauge steel exterior with silver gray hammerloid enamel finish; 2 stainless steel adjustable shelves; fully insulated with glass wool; 6 pilot lights; power relays; and all necessary switches, contacts, etc.

★ Contact the nearest Harshaw Scientific office for complete details on Power-O-Matic

SPECIFICATIONS AND PRICES

H-52920—Ovens—Blue M, Power-O-Matic, with Con-Wate mechanical convection, bench models. Models POM-38 and POM-48 have 2 doors. For 230 volts, 60 cycle, single phase, A-C.

| MODEL NUMBER | INSIDE DIMENSIONS (W.xD.xH. IN.) | OUTSIDE DIMENSIONS (W.xD.xH. IN.) | MAX. WAT. | PRICE |
|--------------|----------------------------------|-----------------------------------|-----------|---------|
| POM-14 | 14 x 14 x 14 | 44 x 20 x 32 | 2800 | 546.00 |
| POM-20 | 20 x 18 x 20 | 50 x 24 x 38 | 4000 | 649.00 |
| POM-25 | 25 x 20 x 20 | 59 x 26 x 38 | 4400 | 759.00 |
| POM-38 | 38 x 20 x 25 | 68 x 26 x 43 | 5800 | 975.00 |
| POM-48 | 48 x 24 x 36 | 78 x 30 x 54 | 8500 | 1595.00 |

H-52925—Ovens—Blue M, Power-O-Matic, with Con-Wate mechanical convection, floor models. Models POM-130 and POM-140 have 2 doors. For 250 volts, 60 cycle, single phase, A-C.

| MODEL NUMBER | INSIDE DIMENSIONS (W.xD.xH. IN.) | OUTSIDE DIMENSIONS (W.xD.xH. IN.) | MAX. WAT. | PRICE |
|--------------|----------------------------------|-----------------------------------|-----------|---------|
| POM-100 | 14 x 14 x 14 | 30 x 25 x 62 | 2800 | 546.00 |
| POM-110 | 20 x 18 x 20 | 37 x 29 x 65 | 4000 | 649.00 |
| POM-120 | 25 x 20 x 20 | 45 x 31 x 65 | 4400 | 759.00 |
| POM-130 | 38 x 20 x 25 | 59 x 31 x 68 | 5800 | 975.00 |
| POM-140 | 48 x 24 x 36 | 72 x 35 x 73 | 8500 | 1595.00 |

(NOTE: Models POM-14 and POM-100 are also available for 115 volts, 60 cycle, A.C.)

Any model can be furnished with stainless steel exterior at 20% over the above prices.

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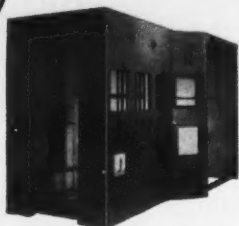
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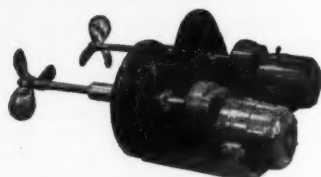
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LABORATORY

Magnetic stirring bar protected by plastic resists corrosion

Corrosion-resistant stirring bars are available in three sizes. Vacuum-tested casing of Kel-F plastic permits magnetic stirring bars to be used indefinitely in highly corrosive acids, alkalis, solvents and peroxides from — 200° to 200°C without corrosion. Low

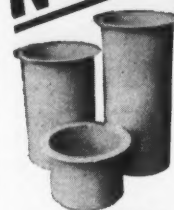


Casing of Kel-F protects stirring bars from corrosion

thermal conductivity and expansion of Kel-F casing precludes danger of breakage from sudden changes in temperature. Non-porous and non-absorbent covering on magnet can be sterilized repeatedly without any damage to the unit.

(Magnetic stirring bars described in above article are a product of Arthur H. Thomas Company, Department CP, West Washington Square, Philadelphia, Pennsylvania ... or for more information reader may simply check CP 3595 on the convenient Reader Service slip which is located between pages two and three.)

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CHEMICAL PROCESSING

**Charges from 2 ml to 72 liters
fractionated with ease
by Dalin distiller . . .**

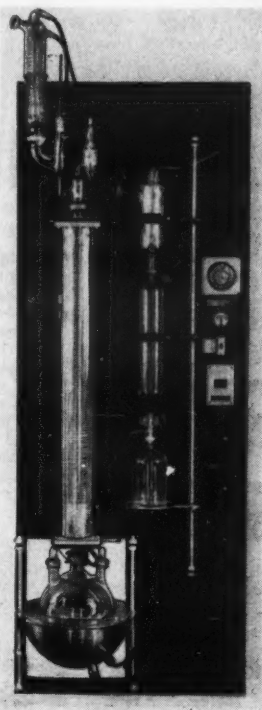
apparatus operates at temperatures to 350°C

Uses: Designed for laboratory and pilot plant distillation problems where substantial quantities of materials must be fractionated under carefully regulated temperatures.

Features: Apparatus handles charges ranging from 2 ml to 72 liters. Standard columns can be supplied with boil-up rates as high as 30 liters per hour.

Description: Columns are heated by coiled-ribbon windings, making it possible to operate with ease at temperatures as high as 350°C. Differential thermocouples and thermometers are located within each winding. Either glass or metal helices may be used as column packing. Flasks as large as 22 liters may be cradled in heating mantles and raised into contact with column by hand wheel. Larger flasks are supported in mantles on tripods resting on floor.

(Dalin Distillation Apparatus is a product of Scientific Glass Co., Dept. CP, 100 Lakewood Terrace, Bloomfield, New Jersey . . . or for more information about manufacturer's product reader may simply check CP 3598 on the convenient Reader Service slip which is located between pages two and three.)



**For the latest in laboratory
equipment . . .**

look in the alphabetized, itemized Product Directory beginning on page 213. All articles presented in this issue of CHEMICAL PROCESSING are listed there.



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PUTS CHILL ON
RESEARCH LAB PROBLEM**

for **Celanese**
CHEMICALS

John Armstrong (right), president of Delta Engineering and Conditioning Co., East Orange, N. J., and A. G. Scott, Celanese plant engineer, discuss final details of the installation just prior to putting the system into service.

To solve a problem, first get to the center of it; and that's just what the engineers of Celanese and Delta Engineering did at the Celanese Corp. of America's Summit, N. J. research lab.

The nub of the problem called for controlled temperatures to be made available throughout the building for research and pilot plant work. The solution centers on a p-k brine storage chiller centrally installed in the basement. Around it is the system of the closed-circuit type, composed of compressor, pumps, brine make-up and mixing tanks, with all instruments and controls mounted in a centrally located control panel.

Elimination of the conventional, open roof tanks means a clean system, while careful integration of units ensures ease of maintenance. This compact p-k chiller installation, requiring only minimum insulation and floor space, is factory assembled in the 780 gal. brine storage tank. From here, brine is circulated throughout the building at -15°F. to -10°F., with Freon 22 used as the cooling medium.

We believe that you, like the Delta Engineering and Conditioning Co., will find it easy and profitable to work with p-k specialists in the design, manufacture and application of heat transfer equipment. Write for information.



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Low-cost way to pump liquids from drums

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This hard-working pump can empty a 55-gallon drum in just three minutes, yet it weighs only 15 pounds! It's Graco's amazing Fast-Flo, at a low price that will surprise you. Fast-Flo has dozens and dozens of time-saving applications . . . almost every plant handling fluids can use one or more to advantage.

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DRUM PUMP

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When inquiring check CP 3600 on handy form, pgs. 2-3

LABORATORY

Self-adhesive lab labels, made of plastic stock, resist chemicals

Plastic impregnated stock is used for laboratory labels. Resistance to soaps, acids, alkalis, oil, greases, and salt water are reported by manufacturer. Labels are self-sticking, easily removed, and offer marking surface for typing, stamping, or writing. Three sizes are packed in sheets 4 x 6", with 500 labels to box.

(Kum-Kleen labels are made by Avery Adhesive Label Corp., Dept. CP, 1616 S. California St., Monrovia, Calif. . . . or for more information reader may simply check CP 3601 on the handy form, pages two and three.)

Molecular weight, vapor equivalent of liquids given

Apparatus measures volume of vapor equivalent to a unit volume of liquid after vaporization and determines molecular weight. Unit is designed primarily for liquid residues from natural gas samples, but will handle any liquid with a vapor pressure of more than 4mm Hg at temperature of vaporization bulb.

Analytical instrument is a compact unit, with a vaporization bulb, integral multiplying manometer, and removable sample entry system consisting of orifice and matching pycnometer. It is mounted in an all-glass constant temp bath, with stainless snap-in clamps, and is supplied with preformed immersion heater.

In operation, pressure is read on multiplying manometer after sample is admitted to pycnometer and then to previously evacuated vaporization bulb. Molecular weight is calculated from previously determined sp gr. Vapor equivalent is measured in gaseous ml per liquid ml; sensitivity is 1½ ml for each ml on manometer scale.

(Vapor Equivalent apparatus is a product of Phillips Petroleum Co., Dept. CP, Bartlesville, Okla.)

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For development work and new product testing, Minn. Mining technicians approve the wide temperature range . . . variety of raw materials handled . . . capacity for large samples.

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- Accurate—speedy—rugged

Manufacturers of Ovens for all purposes

Minnesota Mining & Manufacturing Company uses Despatch "V" Ovens in research and control of "3M" products and applications. Users of Despatch Ovens from its earliest days, this well-known company now has scores of them in its various departments. For information on how Despatch can be put to work on your laboratory and production problems, write for Bulletin No. 107.

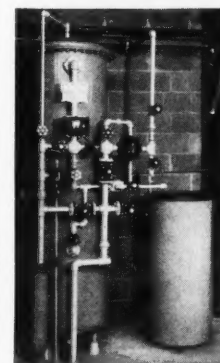


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When inquiring check CP 3602 on handy form, pgs. 2-3

ULTRA-DEIONIZER

Produces Highest Quality Mineral-Free Water



This remarkable single tank, mixed-bed ion exchange unit produces deionized water for less than 25 cents per 1000 gallons (based on 10 grain water).

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Write for Bulletin 512

ZEOLITE WATER SOFTENERS

New Bulletin 611 describes "Double-Check" type water softener that delivers up to 44% more soft water. Also covers complete line of equipment and treatment for any water conditioning need. Write for your copy.

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DIVISION OF ELGIN SOFTENER CORPORATION
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OTHER PRODUCTS: Softeners • Dealkalizers • Lime Soda Softeners • Write for Bulletins • Deaerating Heaters • Filters • Treatment

When inquiring check CP 3603 on handy form, pgs. 2-3

CHEMICAL PROCESSING

FOR THE LABORATORY

**Rapidly lowers water bath temp
and holds it at set point
to within $\pm 0.1^\circ\text{C}$. . .**

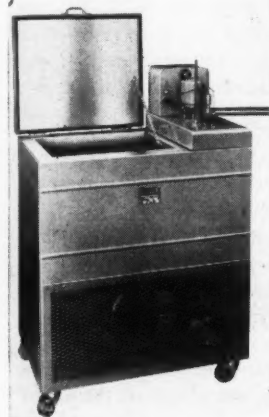
temperatures as low as -30°C are controlled
through sensitive electric relay

Uses: Designed as cold storage box or efficient
portable pumping system, unit can be used for
water and sewage BOD tests, clinical and biochemi-
cal procedures, viscosimeter tests, or for cooling
condensers, refractometers and spectrophotometers.

Features: Temperature may be controlled to
accuracy of $\pm 0.1^\circ\text{C}$ near room temperature or to
within $\pm 0.01^\circ\text{C}$ at lower ranges.

Description: Water bath has insulation at sides
and beneath bottom in double-walled cabinet. Inner
bath and cover panel are formed of stainless steel.
Combination pump and stirrer motor is mounted
on top of cabinet to
simplify servicing.
Centrifugal pump
has extension of
shaft for stirrer.

Control of tem-
perature is effected
through electronic
relay which is actu-
ated by less than 80
microamps. Sensitiv-
ity of temperature
control is achieved
by thermoregulator
acting through this
relay. Starting from
room temperature
and using the pump-
ing feature, small
bath will pull down
to -30°C in five
hours; larger bath



Water bath provides for
pumping coolant at 3 gpm
to equipment requiring
cooling

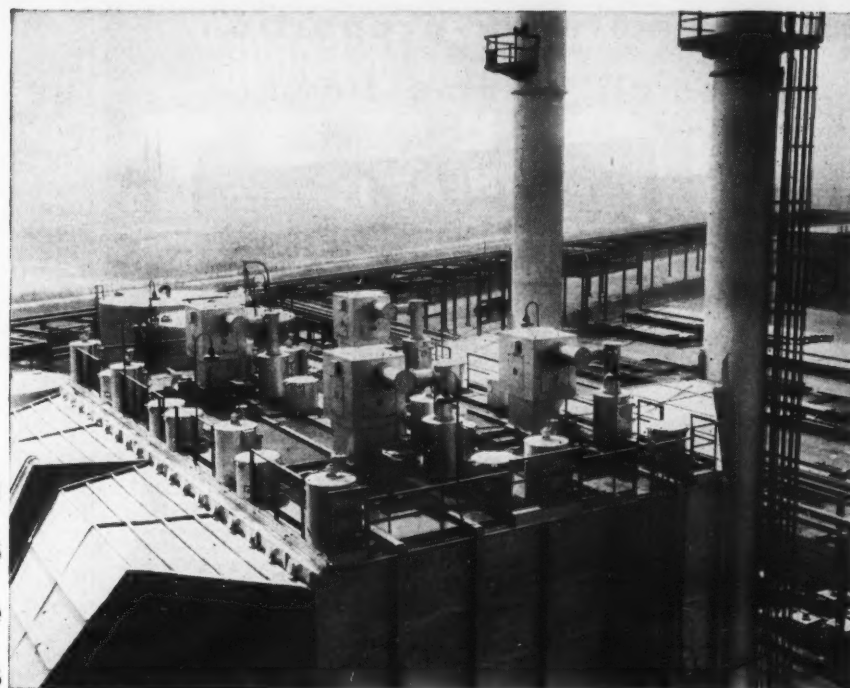
takes 4.5 hours to cool to 0°C .

Overall dimensions of small bath are $30\frac{1}{2}$ " wide
by 18" deep by 45" high; for the large bath, 40"
wide by 25" deep by 50" high. Small unit draws
950 watts a 115v, 60 cy AC; large bath, 1050 watts
at 115v, 60 cy AC.

("Lo-Temptrol" low temperature baths and circulat-
ing systems are product of Precision Scientific Co.,
Dept. CP, 3737 Cortland St., Chicago 47, Ill. . . .
or check CP 3604, pages 2 and 3.)

Temperature problems? Heat losses? Pages
202 and 204 show you how to figure Refrac-
tory Heat Content, Thermal Conductivity

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Succeeds
like
Success**



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problems that are being solved by Buell's 'SF' Electric Precipitators.

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tral switchboard . . . the proved efficiency of the exclusive Buell Spiralectrode,
are all elements of simple overall design.

Dozens of Buell 'SF' Electric Precipitators are already operating or in the works.
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and Recovery of Industrial Dusts" which
tells about *all three* Buell Systems of indus-
trial dust recovery. Write today! Buell
Engineering Company, Department 11-K,
70 Pine St., New York 5, N. Y.

buell

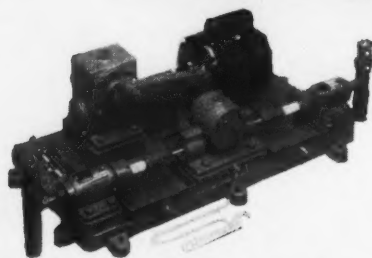


20 Years of Engineered Efficiency in
DUST RECOVERY SYSTEMS

When inquiring check CP 3605 on handy form, pgs. 2-3

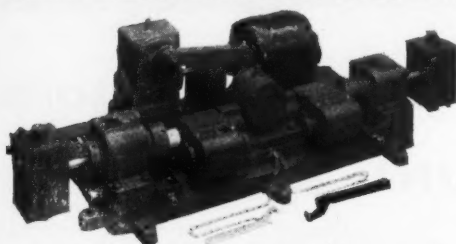
If you meter or proportion
small volume flows...

**THERE IS
A HILLS-McCANNNA
"U" TYPE PUMP
TO DO THE JOB**



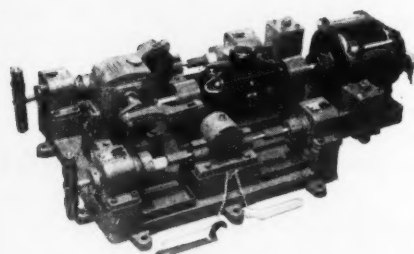
**STANDARD
1, 2, 3 or 4 FEED
UNITS**

Standard "U" Pumps are available in maximum capacities from 0.10 to 24.0 gal. per hr. per feed. Operating pressures from 125 to 5000 psi.



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"U" Pumps can be furnished with a variable speed drive which permits varying capacity remotely or automatically when combined with the proper auxiliary equipment.

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HILLS-McCANNNA

metering and proportioning pumps

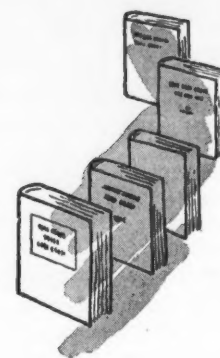
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FORCE FEED LUBRICATORS • MAGNESIUM ALLOY SAND CASTINGS

When inquiring check CP 3606 on handy form, pgs. 2-3

Recent Books



**Comprehensive Inorganic Chemistry,
Vol. II
Copper, Silver, and Gold**

Reviewed by JOHN W. MURRAY
Professor of Chemistry
Virginia Polytechnic Institute

This 248-page book is the second in a series of eleven and contains three chapters — one on each member of the group. The chapter on copper comprises nearly one-half of the book. The occurrence and metallurgy of each metal are treated at great length and are followed by descriptions of the commercial forms of the metals and of their alloys. The chemical properties of the metals and their significant compounds are then discussed.

As stated in the preface, this series is planned to be comprehensive in the extent of the field covered rather than in the fullness of the treatment. The editors consider the methods of producing the metals from their ores to be the most important part of the subject, and nearly one-half of the book is devoted to this phase. This division appears to be somewhat unbalanced, from the viewpoint of the student of chemistry, since many of the methods discussed are no longer used and some of the procedures are not chemical in nature.

James W. Laist's interpretation of the chemical properties in the light of atomic and molecular structure and the periodic table does not receive the emphasis that the preface would lead one to expect, being largely confined to the eight-page introduction.

The book is written in a very readable fashion and is well documented and indexed. It should prove useful to advanced students of chemistry and to workers in the metal industries.

To obtain "Comprehensive Inorganic Chem-

istry, Vol. II, Copper, Silver, and Gold" remit \$5 direct to D. Van Nostrand Co., Inc., Dept. CP, 250 Fourth Ave., New York 10, N. Y. When inquiring specify CP 3607 on handy form, pages 2 and 3.

Chemical Business Handbook

(Staff Review)

If Frederick Winslow Taylor, a pioneer of scientific management, were alive today, he would find this volume of approximately 1400 pages to be, perhaps, the graphic realization of his aim: the objective, systematized approach to management problems.

We in the chemical processing field are for the most part engaged in the research, engineering, or production phases of the industry. Yet there is another important phase: the business end. This includes finance, sales and advertising, market research, accounting, personnel, public relations, patents and law, traffic management, safety, and insurance.

Over a hundred contributors have covered these subjects in detail in the twenty sections of the handbook, edited by the late John H. Perry. Especially complete is the section on market research data and sources of information. Also included are management-slanted discussions of research, chemical development, and production. There is a section each on report writing and business mathematics. Although the volume is sectionalized, there is of necessity, considerable overlap between sections. A 30-page index, however, serves as a cross-reference. Size and format of handbook are similar to the companion volume, Chemical Engineers' Handbook.

To obtain "Chemical Business Handbook" remit \$17.00 direct to McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36, New York.

Toxicity of Industrial Organic Solvents

Reviewed by E. E. SIMPSON
Dublin, Virginia

This book was prepared by Ethel Browning under the supervision of the Toxicology Committee of the British Medical Research Council, and is a compendium of information on 126 solvents commonly in use in industry.

The solvents are grouped as to classification, i. e., hydrocarbons, ketones, glycols, esters, etc. Presentation of the information is excellent. The most common chemical name with the structural formula heads the section; then in order are properties, method of manufacture, uses and applications, and toxicity. Where pertinent a discussion of explosive risks is given and in some instances methods of estimation in air blood or urine are presented. Under toxicity, the effects in animals and in man are discussed. Throughout the book statements of clinical findings are accompanied by reference to the authority. There are 53 tables showing the effects of various concentrations of solvents. An extensive bibliography covering up to the year 1948 appears at the end of each chapter. The index is very usable with many cross references.

This 411-page book is primarily for physicians concerned with industrial medicine, but would be a worthwhile addition to the library of safety engineers or any others interested in health of individuals working with organic solvents.

To obtain "Toxicity of Industrial Organic Solvents" remit \$8.00 direct to Chemical Publishing Co., Inc., Dept. CP, 212 Fifth Avenue, New York 10, N. Y. When inquiring specify CP 3608 on handy form, pages 2 and 3.

Quality Control

Reviewed by D. S. DAVIS
Professor of Chemical Engineering
Virginia Polytechnic Institute

In revising "Quality Control," N. L. Enrick has added 60 pages of text, charts, and tables to achieve an extremely readable manual well-suited to the needs of a manu-

facturer about to adopt methods of inspection for the first time. The treatment is simple, elementary, and somewhat informal.

Part I is concerned with methods of inspection; Part II deals with control charts for variables, defectives, and inspection for acceptance and with a nonmathematical and brief discussion of the analysis of variance.

Though the book has little to offer the trained and industrially experienced statistician for himself, it can help him to acquaint inspectors, foremen, and superintendents with the essentials of a program of quality control. As such the book could be used where "in-service" courses are offered since the treatment is not likely to discourage practical operating men.

In 181 pages the author has done splendid missionary work. The charts are good, the illustrative examples are well-chosen, and the writing is lucid.

To obtain "Quality Control" remit \$4.00 direct to The Industrial Press, Dept. CP, 148 Lafayette St., New York 13, N. Y. When inquiring specify CP 3609 on the convenient Reader Service slip which is located between pages 2 and 3.

Encyclopedia of Chemical Technology, Vol. XII

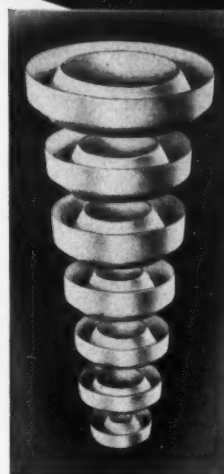
(Staff Review)

Within its 955 pages, this twelfth volume covers the field of chemical technology between "Sabadine" and "Stilbestrol." Seventy authors have contributed to the volume.

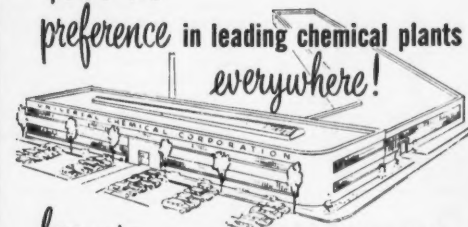
Especially comprehensive is the treatment of these subjects: safety, salicylic acid, sampling, saponins and sapogenins, sedimentation, sequestering agents, sewage, silica, silicates, and silicon compounds, silicones, silver and compounds, particle size reduction, separation, and measurement, smokes and fumes, soaps, soil chemistry, solvents and recovery, steel, stereochemistry, and sterols and steroids.

To obtain "Encyclopedia of Chemical Technology, Vol. XII" remit \$30 (\$25 to subscribers) direct to Interscience Publishers, Inc., Dept. CP, 250 Fifth Ave., New York 1, N.Y. When inquiring about this book, reader may simply specify CP 3610 on handy form, pages 2 and 3.

"JOHN CRANE" TEFLON "C-V" rings



First in preference in leading chemical plants everywhere!

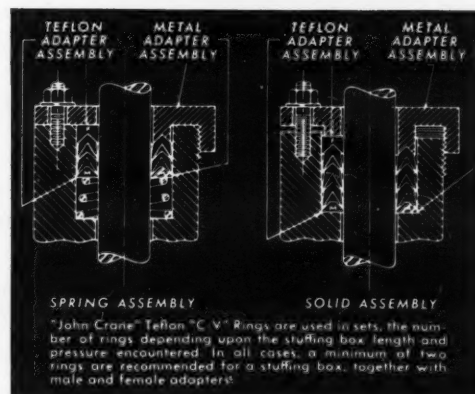


because... Teflon "C-V" Rings withstand

1. Temperature from -94°F. to $+482^{\circ}\text{F.}$
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Why repack with ordinary materials when chemically inert "John Crane" Teflon "C-V" Rings will effectively seal any corrosive liquid or gas and resist high temperatures as well. In addition, they have extremely low friction characteristics—will not shrink, swell, harden, dissolve, corrode or deteriorate. Ideal for use on all valve stems and reciprocating pumps as well as many centrifugal and rotary pump applications. Cross-section design allows sealing at finger-tight gland pressure.

"John Crane" has developed a complete line of standard size Teflon "C-V" Rings and male and female adapter rings to meet practically every need. If you have special requirements, "John Crane" can mold additional sizes to fit your stuffing box requirements.



"John Crane" Teflon "C-V" Rings are used in sets, the number of rings depending upon the stuffing box length and pressure encountered. In all cases, a minimum of two rings are recommended for a stuffing box, together with male and female adapters.

Send for complete information, including this illustrated technical booklet, "The Best in Teflon." Crane Packing Co., 1821 Cuyler Ave., Chicago 13, Ill.

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CRANE PACKING COMPANY



When inquiring check CP 3611 on handy form, pgs. 2-3

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ULTRAVIOLET PRODUCTS
of major importance to you

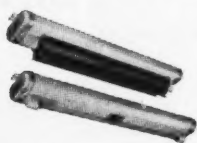
1 HANOVIA EXPLOSION-PROOF GERMICIDAL LAMP UNIT—



Where concentrations of explosive fumes or ignitable gases have precluded air sterilization by ultraviolet irradiation, this Hanovia explosion-proof germicidal lamp unit may safely be used to eliminate air-borne contamination and insure safety of product and personnel. Units are particularly valuable for use in transfer hoods and are designed, too, for a wall or ceiling mounting to furnish direct or indirect irradiation. Approved by Underwriter Laboratories for Class I hazardous locations Group C and D.

All surfaces are rounded for quick, easy positive cleaning—no dirt-catch corners.

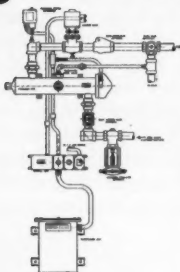
2 HANOVIA LETHERAY—



For non-hazardous areas, air-borne bacteria, viruses, fungi, and mold spores are effectively destroyed with Hanovia Letheray ultraviolet fixtures. Effectively protects humans against infectious diseases, protects products against spoilage by contamination.

For intense irradiation at focal points, unit mounts directly over tables and benches, in fume hoods, and sterilizing cabinets, over conveyors, hoppers, and packaging machinery. May also be mounted on ceilings or walls for direct and indirect irradiation.

3 HANOVIA STERITRON—



Most efficient and dependable method of sterilizing deionized water and water for beverage and other industries. As water passes through the Steritron, powerful ultraviolet rays effectively destroy all bacteria and other contaminating organisms—even those that escape finest filters.

Steritron sterilization has many advantages over other methods now in use: No chemical additions to water required, physical structure of water remains unchanged, completely automatic to give continuous flow sterilization.

**YOURS
ON REQUEST:**

Interesting, informative brochures detailing benefits of these Hanovia ultraviolet products. Without obligation, write for your copies today.

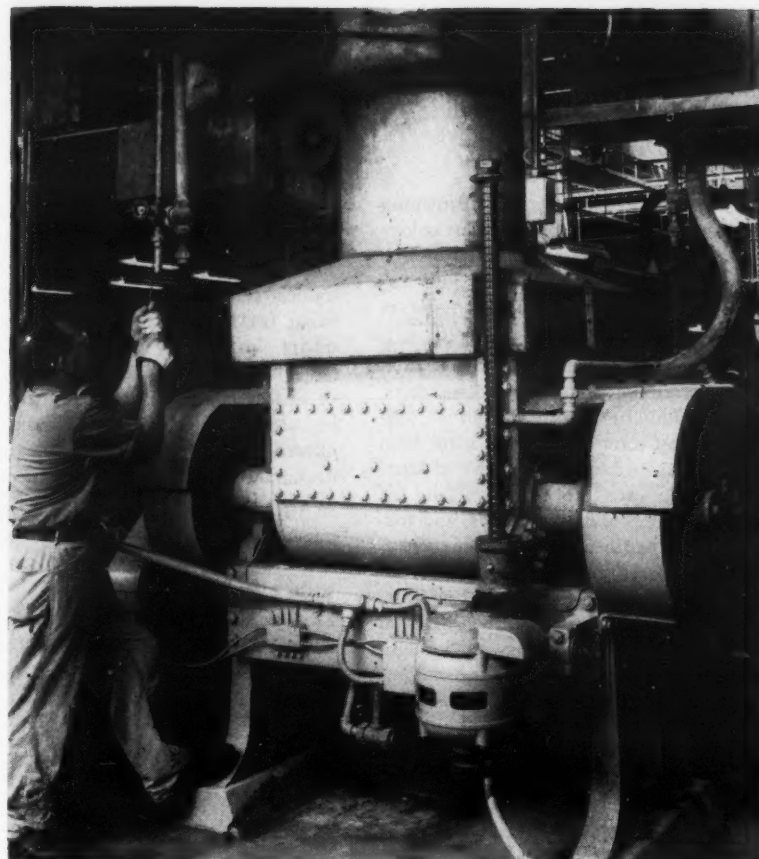
HANOVIA
CHEMICAL & MFG. CO.

Germicidal Equipment Division

Dept. CP-11
Newark 5, New Jersey

When inquiring check CP 3612 on handy form, pgs. 2-3

safety



Dumping of acid and lead oxide dust into a paste mixer is no problem at Electric Storage Battery Company's Crescentville plant. Hood (center) is gravity-sealed to the mixer lip on a neoprene seat. Note that it is unnecessary for workers to wear respirator in this operation

Special hood design overcomes difficult ventilation problem at Electric Storage Battery Co. and provides . . .

safe handling of lead oxide

Control of toxic dusts in paste mixing operation makes plant safer

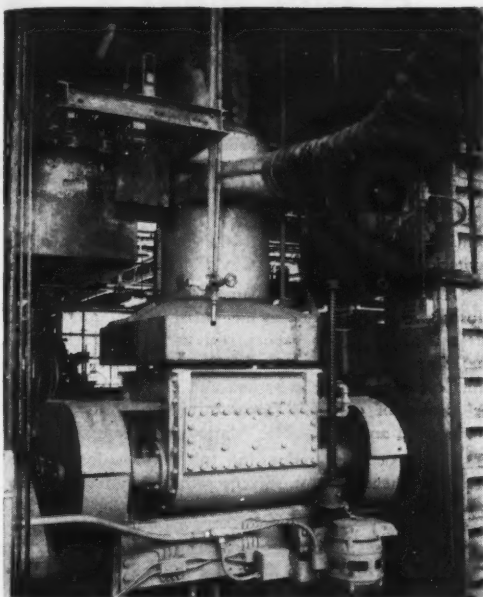
HOWARD F. HIRST, Ventilation Engineer
Electric Storage Battery Company
Crescentville plant
with **RICHARD J. CALLAHAN**, Assistant Editor

Problem: Highly toxic lead and lead oxides are serious health hazards if not properly controlled. At the Electric Storage Battery Company's Crescentville plant in Northeast Philadelphia, a difficult ventilation problem was encountered in control of lead oxide in preliminary stages of a paste mixing operation. Potential health hazard

caused engineers to examine the problem closely.

Existing buildings, space requirements and volume of production limited Exide plant engineers to design of hoppers holding up to a ton of blended lead oxide on the floor directly above each paste mixing machine. Mixer was loaded by pulling lever which released material in an 18-foot drop. Anticipating blow-back of the lead oxide dust into the working area, a restraining hood was built and suspended from the hopper chute. Sliding joint was provided to allow elevation of the hood to clear mixer when dumping the completed paste.

Production tests revealed severe leakage around the gasket of sliding joint regardless of gasket material used. In addition, dust particles required up to five minutes to settle sufficiently to permit proceeding



Immediately after completion of the dumping operation, suction is initiated and hood is raised one to two inches above mixer lip. Careful design of the hood's plenum chamber encourages rapid establishment of desired air flow. Lead oxide particles are exhausted through flexible connection in right foreground. Billowing of dust is eliminated, and within five minutes hood can be elevated to permit visual inspection of the mixing operation

with the mixing operation.

Solution: In an immediate effort to remedy the situation, Exide plant engineers called for a 6-inch outlet in the 1/4-inch steel plate which formed the lower surface of the hood and sealed the mixer during the filling operation. A collar was welded around the opening and a flexible purge duct provided. Dust was exhausted through purge duct by fan into a bag collector. This design was adequate as a temporary measure, and permitted production at a high rate. However, a more permanent form of protection was needed.

Sudden dropping of heavy load into mixer was followed rapidly by a chemical reaction evolving quantities of steam. Condensate of this steam formed a slurry with the dust which often splashed into the purge duct. This tended to clog the opening and cut down ventilation efficiency.

New design called for counter-weighted hood surrounding lower section of chute. Sliding joint feature was retained to permit elevating hood the necessary thirty inches to clear mixer, which dumped by tilting. From a circular cross section, hood was fabricated to surround the four sides of mixer. Within this rectangular cross section was bracketed a 1/4-inch steel plate with appropriate cutout. Lower edge of hood extended below the mixer lip to form a skirt. One-

(Continued on page 135)



don't give fire a fighting chance— Install a Blaw-Knox Automatic Fog System

A single Blaw-Knox Fog Nozzle, shooting its dense, quenching fog into the very heart of a starting fire, can accomplish more than several hose streams each having ten times its capacity.

Controlled by rate-of-rise thermostats, Blaw-Knox Fog Nozzles protect you around the clock, sounding alarms and putting water to work instantly wherever and whenever needed. Their finely divided fog rapidly extinguishes the fire, dissipates heat, prevents development of high temperatures and bursting pressures, confines damage to a small area.

Multiply this kind of fire fighting efficiency in a system engineered to guard against your

specific hazard and you are assured of a maximum of protection.

Why not let a Blaw-Knox Fire Protection Engineer study your needs and submit a cost estimate and preliminary layout?

You'll be interested in the new Blaw-Knox booklet, "Fire Can Destroy Your Business." There's no charge. Write for it.

BLAW-KNOX FIRE PROTECTION SYSTEMS CARRY APPROVALS OF ALL INSURANCE UNDERWRITERS • Deluge Systems • Wet Pipe Systems • Dry Pipe Systems • Water Spray and Fog Systems • Rate-of-Rise Sprinkler Systems • Foam and Carbon Dioxide Extinguisher Systems

"Little
Joey
Sprinkler"
always
on the
job

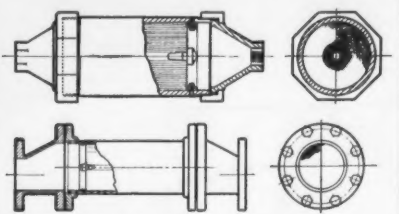
BLAW-KNOX COMPANY

Automatic Sprinkler Department / Pittsburgh 33, Pennsylvania



When inquiring check CP 3613 on handy form, pgs. 2-3

OCECO Flame Retarders



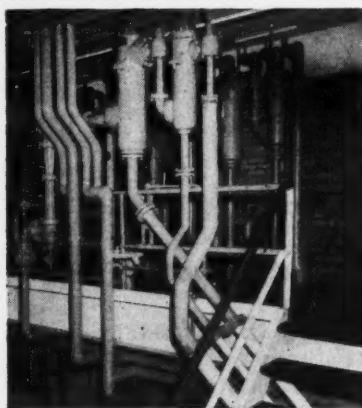
prevent "Flash-Backs" in pre-mixed Gas Lines

Service proved for years. Retarding element consists of corrugated and flat aluminum sheets rolled into a tight cylinder, inserted in the housing and expanded tightly with tapered plugs. Dissipates any heat from the down

stream side so gas on the up stream side is always below ignition temperature. Straight through passages minimize pressure drop and permits easy cleaning. 1/2 inch to 6 inch sizes. Write for fully descriptive data sheet.

OCECO TANK FITTINGS
THE JOHNSTON & JENNINGS CO.
division of PETTIBONE MULLIKEN CORP.
4751 West Division St. • Chicago 51, Illinois

When inquiring check CP 3614 on handy form, pgs. 2-3



This illustration shows two 4-stage EVACTOR units in the plant of a leading manufacturer of vitamins and other pharmaceuticals. The same plant uses numerous other C-R EVACTOR units of different types — as do the majority of manufacturers in this important field — for many different processes, including deodorizing, distilling, drying, refrigeration, etc. They are as simple as the valves that turn them on, yet maintain absolute

LET C-R EVACTOR units help improve your health

pressures down to a small fraction of 1 m.m. absolute where steady, dependable vacuum is extremely important. This steady, dependable vacuum is contributing to the improved health of our population by helping to supply purer and more potent vitamins, antibiotics and other pharmaceutical products. C-R also supplies Jet Mixers, Jet Heaters, Jet Absorbers, Jet Scrubbers, Jet Pumps, Jet Condensers and Barometric Condensers.



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Main Office: 751 Central Avenue, Westfield, N. J.
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CHILL VACTOR UNITS • EVACTOR STEAM JETS • CONDENSING EQUIPMENT

When inquiring check CP 3615 on handy form, pgs. 2-3

SAFETY

**Lets out wail to warn
of fire . . .**

alarm uses compressed gas to sound warning horn

Cylinder of compressed gas is attached to alarm horn. When temperature surrounding unit rises above 136°F, valve opens automatically and horn wails loud warning.

Unit is 15" in length and weighs only 3 lb. Duration of alarm is five to eight minutes. Alarm is loud enough to be heard above industrial noises.

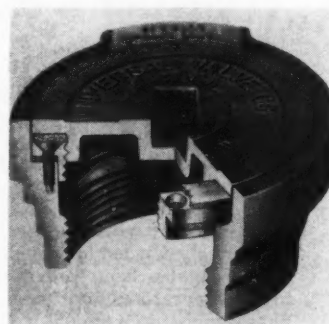
(Fyr-Larm is a product of the Fyr-Larm Co., Inc., Dept. CP, P.O. Box 29, Summit, N. J. . . . or for more information check CP 3616 on handy form, pages 2 and 3.)

Eliminates dangerous errors in fuel deliveries . . .

replaces painting of fill box covers for identification

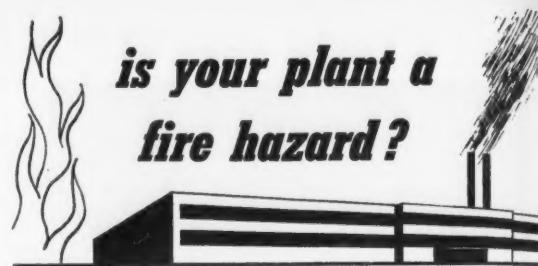
Combination fill box, product identification marker and replaceable thread ring avoids costly and dangerous errors in fuel deliveries.

Practice of painting and maintaining color schemes on fill box covers is eliminated with unit.



Eliminates need for painting fill box covers

Product is clearly stamped on aluminum identification tag which is fastened to body by two screws. Both sides of marker can be



Venting inflammable gases to the atmosphere is a direct invitation to fire or explosion.

A Barnebey-Cheney system recovers these gases, exhausting odor-free air to the surrounding atmosphere. Often it also recovers vapors, such as solvents, which are hazardous and noxious. Savings by re-use of these solvents often pay for the system and exhausting odor-free air instead of offensive fumes means the difference between good and bad public relations for plant owners.

Write or wire today for full information on the Barnebey-Cheney air or solvent recovery system. There's no obligation.

BARNEBEY-CHENEY
Company
CASSADY AT EIGHTH COLUMBUS 19, OHIO

In Canada: BARNEBEY-CHENEY LTD., St. Johns, Quebec

When inquiring check CP 3617 on handy form, pgs. 2-3

SAFETY EQUIPMENT FOR ALL INDUSTRIES

Design, Materials & Construction

NEW

Patent No. 2169745

The IPCO

NITROMETER MASK

WITH
Clear, Frosted Vinylite Hood

Designed for protection on acid line breaks and other jobs and operations where complete face, head and neck coverage is required. Aluminum frame with new adjustable fibre headgear. Fitted with clear, frosted vinylite hood as illustrated. Hood is non-flammable, light in weight, strong and serviceable. Electronically sealed; no thread seams to burn out or deteriorate. Wear-appeal to the workmen.

WRITE FOR BULLETIN 57

IPCO Safety Equipment for all Industries

INDUSTRIAL PRODUCTS COMPANY

2834 N. FOURTH STREET • PHILADELPHIA 33, PA.

When inquiring check CP 3618 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Would you like
to receive
CHEMICAL PROCESSING
personally?

It will be sent to you
without charge or
obligation . . .

. . . if you qualify
. . . if you request it

If you are responsible for processing operations in an administrative capacity as plant superintendent, chemical engineer, chemist, engineer or equivalent responsibility . . . in a plant of substantial operations* where chemical processing is an important factor . . . **CHEMICAL PROCESSING** will be sent to you without charge or obligation if you request it. Use form below. In requesting, be sure to answer all questions. If your firm is not rated or listed in standard references, indicate size of the company by capacity, annual sales or number of employees. Unless all information is given, magazine will not be sent.

*"Substantial operations" does not necessarily mean an extremely large plant. But requests for the magazine exceed supply so we must set standards to insure publication being sent where it can be used to best advantage.

CHEMICAL PROCESSING
111 EAST DELAWARE PLACE
CHICAGO 11, ILLINOIS

Please send me **CHEMICAL PROCESSING**
without charge or obligation

Name

Title

Company

Rating of Company

Street

City Zone

State

Main Products

SAFETY

stamped with product identification. When products are switched, marker is either exchanged or flipped over. Reversible markers are available stamped to order or left blank.

Unit has iron body and bronze cap with specially-treated leather gasket for water tightness. Replaceable bronze thread ring is secured to body by four large brass screws and sealed with a vellumoid gasket.

Three models are available in sizes of 2, 3 and 4".

(Universal Model 704M is a product of the Universal Valve Co., Dept. CP, 407 South, Elizabeth 2, N. J. . . . or for more information reader may simply check CP 3620 on the convenient Reader Service slip which is located between pages 2 and 3.)

**Thermal plastic scrap line
checked for tramp iron
by magnetic units**

Expensive calendar rolls used in processing sheets of thermoplastic had to be protected from tramp iron at the Chicago plant of US Rubber Company. Belt conveyor brings plastic scraps to rollers.

Two different types of magnetic separators were installed on belt conveyor to screen tramp metal from the plastic material. Permanent magnetic pulley was installed as head pulley on the conveyor.

This pulley maintains magnetic field so that metallic material is held to belt surface until plastic material falls into bin. Tramp metal is automatically released beyond divider strip and falls into container. Should any tramp articles pass screening process, plate magnet at discharge end of conveyor catches them.

(Magnetic pulley and plate magnet are products of Eriez Manufacturing Company, Department CP, 13 Magnet Drive, Erie, Pennsylvania . . . or for more information check CP 3621 on handy form, pages 2 and 3.)



**FIRE
PROTECTION
IS OUR BUSINESS!**



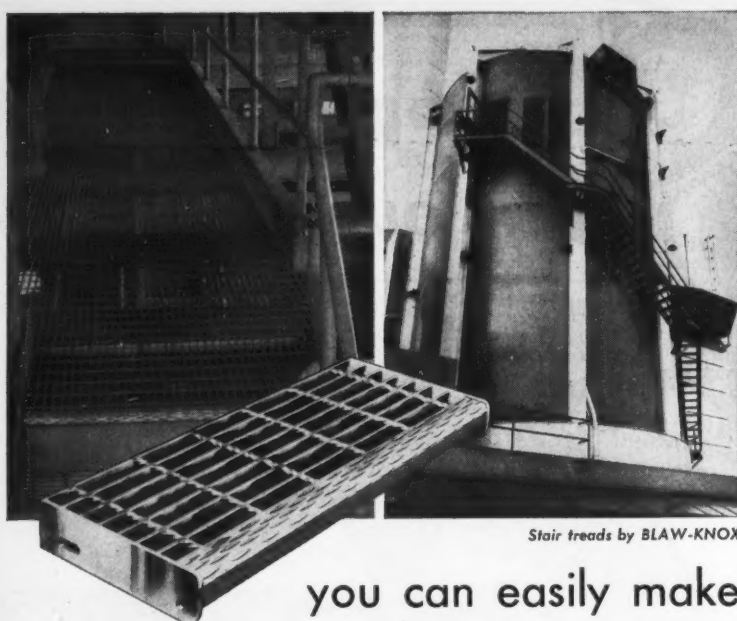
At 'Automatic' Sprinkler, the design, manufacture, installation and maintenance of Engineered Protection for all fire hazards is our constant concern — our basic business objective.

We consider our task of preserving lives, property and money as a full-time job — rewarding to our customers . . . of substantial benefit to the growth and strength of our nation.

"AUTOMATIC" SPRINKLER CORPORATION OF AMERICA
YOUNGSTOWN, OHIO

Offices in Principal Cities of North and South America

When inquiring check CP 3622 on handy form, pgs. 2-3



Stair treads by BLAW-KNOX

you can easily make every step a safe step

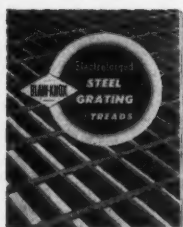
Indoor or outdoor, you can rely on Blaw-Knox Stair Treads to provide the safety you want in your plant.

Designed for tremendous strength against impact, these stair treads are made with twisted cross bars and rolled diamond checkered plate nosing—as illustrated.

But, when desired, you can get treads with a twisted cross bar nosing or an abrasive nosing. And for specially slippery conditions we can supply you with serrated cross bar treads.

Just tell us what your application is and we'll offer our recommendations as to the best type of tread for your job.

**Only Blaw-Knox Electroforged®
Steel Grating and Stair Treads**
—have these five exclusive features:



1. rigid one-piece construction—easy to install
2. all surfaces accessible—easy to paint
3. no sharp corners to clog—self-cleaning
4. maximum open area—for light and ventilation
5. non-slip twisted crossbar—safe footing

A short note will bring you a copy of new Bulletin No. 2365-R
—a dimensional sketch will bring you a quotation.

BLAW-KNOX

BLAW-KNOX COMPANY
2076 Farmers Bank Building • Pittsburgh 22, Pa.

**BLAW-KNOX EQUIPMENT DIVISION
GRATING DEPARTMENT**

GRATING APPLICATIONS: floors • platforms • walkways • catwalks • stair treads • fan guards • shelving • and many other uses, both outdoors and indoors, for versatile steel grating.

When inquiring check CP 3623 on handy form, pgs. 2-3

SAFETY

Develops special fire hose for chemical, oil fires

Uses: For fighting fires in the chemical and oil industry. Hose is built to resist severe oil, chemical, and abrasive conditions which tend to deteriorate ordinary fire hose.

Features: Hose has excellent resistance to weak acids, even at boiling temperature, and to strong acids at room temperature.

Description: Constructed of neoprene tube and covered with strong Dacron, fire hose is impregnated with skim coat of neoprene, making it oil resistant both inside and out. Hose withstands temperatures to 375°F and pressures of 500 psi. It is available in 1½ and 2½" ID sizes.

(Petrochem Hose is a development of the Quaker Rubber Corp., Div. of H. K. Porter Inc., Dept. CP, 342 Madison Ave., New York 17, N. Y. . . . or for more information check CP 3624 on handy form, pages 2 and 3.)

Cold degreasing solvent is nonflammable

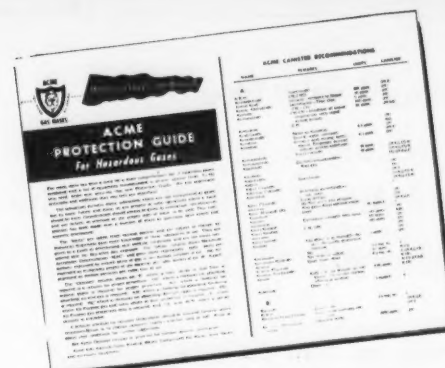
Uses: For cold cleaning and cold degreasing operations in the metal and metal working industries.

Features: Degreaser has low toxicity and is non-flammable.

Description: Called Chlorothene (Inhibited 1, 1, 1-trichloroethane), Dow's cold degreasing solvent is now in large-scale production. It is particularly suited for those applications formerly reserved for more toxic or more flammable solvents.

Although 1, 1, 1-trichloroethane by itself may corrode aluminum and aluminum alloys, Chlorothene, the new inhibited grade, virtually eliminates such corrosion except under severe conditions.

(Chlorothene is a product of the Dow Chemical Co., Midland, Michigan. Check 3625, pages two and three.)



DO YOU HAVE A GAS HAZARD?

**New ACME PROTECTION GUIDE
lists 433 gases, mists, fumes and dusts and
gives specific protection information.**

If you have any hazardous condition involving gases, mists, fumes or dusts, it will pay you to get a copy of Acme's new Protection Guide. Here, in one handy reference folder, is a most comprehensive list of trouble sources including pertinent data, limits, and the Acme canisters designed to give you dependable protection for each specific hazard.

Write today for your free copy of the ACME PROTECTION GUIDE.

Acme Protection Equipment Co.
Manufacturers of Acme Full-Vision Gas Masks
1219 Kalamazoo Street, South Haven, Michigan

When inquiring check CP 3626 on handy form, pgs. 2-3

Obtain Better Lighting for the Seeing Task



If safety regulations, fire insurance or building code call for UL-approved Explosion-Proof lighting, you need not sacrifice proper lighting in order to meet these requirements. You need not handicap workers with poor light which does not fit their particular seeing task. You need not stand for production slow-down in such locations due to improper illumination. The wide variety of reflectors available with Benjamin Explosion-Proof units makes it possible to provide the cor-

rect light for every seeing task found in industrial explosive atmospheres. For utmost protection against depreciation and deterioration, each reflector is covered with "Life-Time" Porcelain Enamel fused to steel... the unsurpassed reflecting surface which resists the corroding effects of fumes, moisture and grime and is easily cleaned with soap and water. **Free Bulletin EP** contains complete Explosion-Proof lighting facts.

BENJAMIN ELECTRIC MFG. CO., Dept. LL Des Plaines, Illinois 336



When inquiring check CP 3627 on handy form, pgs. 2-3

CHEMICAL PROCESSING

(Continued from page 131)

inch annulus was incorporated between skirt and mixer. Lead oxide particles in this operation are known to be very fine with some in the sub-micron range, but an air velocity of 2500 fpm through the one-inch annulus was considered sufficient to capture all the dust.

While filling, mixer is sealed by 1/4-inch steel plate resting on mixer lip. Immediately after filling, hood is raised one to two inches from mixer lip. Hood skirt prevents billowing of dust in the few seconds required for establishment of designed air velocity. Continuously operating roof fan exhausts dust-laden air into a bag collector at 3500 fpm through a 10" diameter neoprene-coated flexible hose. Hose is secured to hood twenty inches above mixer lip, sufficiently distant to eliminate splashing of mix into exhaust opening.

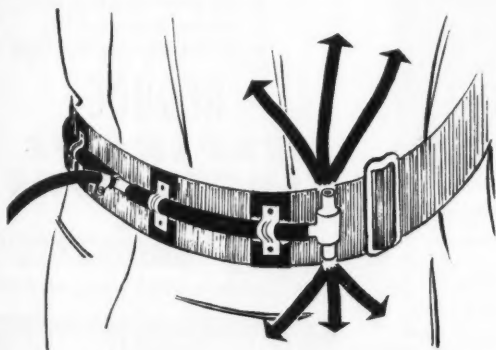
Results: High production level was maintained with virtually no maintenance costs. Tests showed dust level to be well below that required by state regulations for healthful working conditions. Design now is standard for paste mixing operations in various plants of The Electric Storage Battery Company.

(Information courtesy of Electric Storage Battery Co., Dept. CP, Crescentville, Pa.)

**Wearers of protective garments
stay cool and comfortable
using ventilation belt . . .**

delivers constant, circulating stream of cooling air

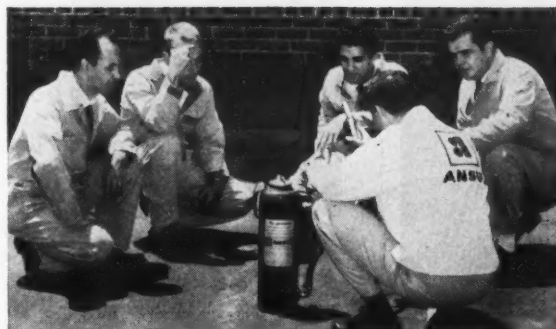
Lightweight ventilation belt has been developed to deliver cooling air throughout protective garments. Air is supplied through 30" length of hose from an



external source. There are no moving parts, valves, or gages. Belt weighs 12 ounces and is adjustable to any waist size.

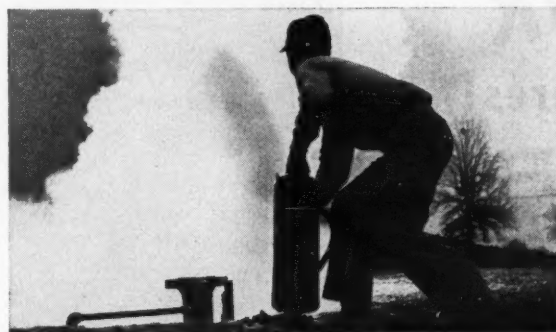
(Ventilation belt is a product of the Standard Safety Equipment Co., Dept. CP, 232 W. Ontario St., Chicago 10, Ill. . . . or for more information check CP 3628 on handy form, pages 2 and 3.)

Here is the most complete fire protection program ever offered



TRAINING FOR YOUR PERSONNEL at your plant is provided by Ansul fire control experts without cost to you.

CUSTOMER SCHOOL AT MARINETTE—best equipped fire control school available for training your key safety personnel.



**Ansul Fire Equipment is Faster,
More Effective**

A positive activating system puts Ansul's "Plus-Fifty" dry chemical to work immediately. To insure full fire coverage, patented nozzles deliver the right kind of stream for your fire protection problem (low velocity or long range). Ansul extinguishers are water-tight, corrosion resistant, always ready for action, even after extreme weathering. Quality features like these make it possible for Ansul to back their equipment with a 5-year warranty.



VISUAL AIDS for your safety meetings designed to make all your employees fire-control conscious.

COMPLETE PLANT SURVEY provided by Ansul is designed to give you the best fire protection possible at the lowest cost.



Call the Ansul Man!

Get in touch with your local Ansul man through the "yellow pages" or write ANSUL CHEMICAL COMPANY, Fire Equipment Division, Department F-124 Marinette, Wisconsin.



When inquiring check CP 3629 on handy form, pgs. 2-3

Scott AIR-PAK



Cool, fresh AIR in hazardous atmospheres!

Why take chances in explosive atmospheres when you can be assured of perfect safety with the Scott AIR-PAK. Breathe cool, fresh AIR with confidence and comfort.

It goes on and is ready for action in seconds. Just turn on the valve and you're ready to go. No complicated training or practice is necessary.

Other exclusive AIR-PAK features include a large-dial easy to read gage for constant, dependable check of remaining air supply. Cool air absolutely prevents lens fogging. The AIR-PAK is the most economical all-purpose breathing protection available. Operates for as little as 50c per hour with no waste.



For complete information
write today!

SCOTT AVIATION CORP.
242 ERIE STREET LANCASTER, N. Y.

Canada: Safety Supply Co., Toronto — Branches in principal cities
Export: Southern Oxygen Co., 15 West 57th Street, New York 19, New York

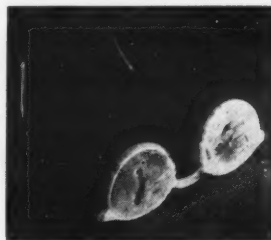
When inquiring check CP 3630 on handy form, pgs. 2-3

SAFETY

**Intensive safety glass program
helps reduce eye injuries
at Houdry Process Corp . . .**

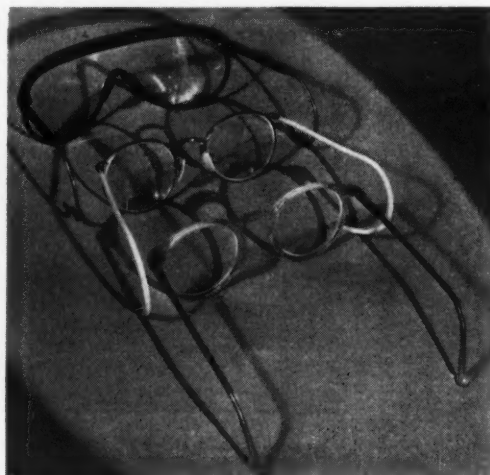
eye injuries under program only 1/3 as frequent as before

Analysis of the safety records at the Research and Development Laboratories of Houdry Process Corp., Marcus Hook, Pa., revealed that eye injuries constituted a disproportionate share of all accidents. Out of a total of 37 accidents reported in 1952, eye injuries accounted for 10. Safety glasses were always available but employees used them only for obviously hazardous operations.



These safety glasses saved
a worker's eyes

Safety committee set up intensive program to make employees safety-glass conscious. All employees were fitted with personal safety glasses. Prescription glasses were provided where required. Personnel and visitors were requested to wear safety



Glasses in foreground are now issued to all employees.
Former types used are also shown

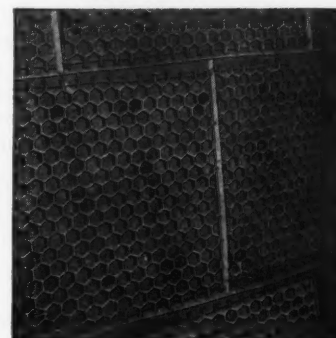
glasses at all times in areas outside of offices. No compulsory measures were adopted but posters and literature were employed advantageously to keep program before employees.

Standard safety glasses issued were Armorplate glass lens with acetate frames. These have thicker than conventional lenses for high impact resistance. Each lens has been tested to withstand impact of steel ball weighing 1.56 ounces dropped from height of over 4 ft. If safety glass should break under severe impact it will generally crumble into small cubicle par-

RIGHT
WHERE IT
COUNTS!

IRVING "GRIDSTEEL" CONTOUR RETAINER MESH

Used with
Castable Ganister Linings
in Refractionating Units
in Petroleum
& Chemical Industries



RIGHT for

- ★ Thermal Cracking Units
- ★ Cyclones
- ★ Fluid Catalytic Regenerators
- ★ Fluid Catalytic Reactors
- ★ Hydroformers & Reactors
- ★ Flue-Gas Stacks & Ducts
- ★ Catalyst-Carrying Pipe Lines

REDUCE EXPENSIVE SHUTDOWNS

by using
Irving "GRIDSTEEL",
the quality contour retainer mesh.

**IRVING SUBWAY
GRATING CO., INC.**
ESTABLISHED 1902

OFFICES and PLANTS at
5050 27th St., Long Island City 1, N. Y.
1850 10th St., Oakland 10, California
When inquiring check CP 3631
on handy form, pgs. 2-3.

CHEMICAL PROCESSING

SAFETY

ticles rather than shatter into sharp jagged splinters. Eye accidents have declined markedly since start of program. From November 1953, to April 1954, only two eye accidents were reported, in contrast to six such accidents for same period in previous year.



Posters keep employees safety glass conscious

One employee, draining vessel of liquid he didn't know had been pressured, received forceful splash on his glasses without injury. Another worker, while cutting head out of steel drum with cold chisel, was struck on frame of safety glasses with pieces of flying metal. Glasses shattered but man was

unharmed. On another occasion, a chemist was struck on the face by an ampule of ethyl amine which exploded as it was being cooled. His safety glasses undoubtedly saved his eyes.

With these cases to back him, Harry Turner, Chairman of the Safety Committee, says, "We have every reason to believe that Houdry's safety record will come closer and closer to the 'no accident' goal as wearing of safety glasses becomes more and more a habit."

(Armorpate safety glasses are a product of the American Optical Co., Dept CP, 2 Mechanic St., Southbridge, Mass. . . . or for more information check CP 3632 on handy Reader Service slip which is located between pages two and three.)



Have a safety problem . . . ?

the handy Product Directory (pages 213 to 216 in this issue) is your guide to equipment and ideas which may suit your needs.

What it takes to make a 3000 Degree Refractory Concrete

Because of the widespread interest in the use of refractory castables, many furnace operators have asked us for the story behind the performance of B&W's unique refractory concrete, Kaocast.

Here are the answers to some of the most frequently asked questions:

Q. When you refer to Kaocast as a 3000 degree refractory castable, do you mean that its melting point is 3000° F?

A. No, this means that its service use limit is 3000° F; its melting point is 200 degrees higher.

Q. Just what does it take to make a 3000 degree refractory castable like B&W Kaocast?

A. Let's first define a few terms. Refractory castables are made with granular materials which are volume stable at high temperatures and which can undergo repeated heating and cooling cycles without disintegration. These materials, known as refractory calcines or grogs, are blended with suitable hydraulic binders. The initial strength of a refractory castable is thus developed in the same manner as that of ordinary concrete—that is, through the chemical action between water



and the binder. A strong ceramic bond is formed when the refractory castable is subjected to temperatures above the vitrification point.

Q. Then you have a grog, a binder and a method of putting them together. Which is most important?

A. You can't say that any one is most important. It's a combination of all three. Let's take them one at a time. Our grog consists primarily of the proper blend of kaolin and other alumina-silica materials. This ratio enables us to achieve a grog with minimum expansion and shrinkage, a high fusion point, and greater stability under load, at varying temperatures.

Q. And now, what about the binder?

A. There are a number of factors responsible for the success of the Kaocast binder. One is the compound Tricalcium Penta-aluminate (3 lime to 5 alumina). This formula produces the most refractory compound (highest melting point) that can be made from lime and alumina. Another is that by using the purest commercially available lime and alumina, the Kaocast binder is substantially free of iron and silica. Such traces of these that are present combine during the pre-

firing of the binder to produce stable compounds.

Q. Just how important is the manufacturing or "blending" of the grog and the binder?

A. If one factor could be singled out as "most important" it would be quality control.

Direct control over the fineness of materials, prefiring temperatures, and other phases of manufacture is possible at B&W because both the grog and the binder are made and blended at B&W's Augusta Works—under B&W's direct control and supervision.

Q. These factors you've discussed must add up to some specific advantages of Kaocast. What are they?

A. B&W Kaocast has all the advantages of easy installation which are responsible for the widespread interest in refractory concretes, plus these exclusive features: It is the only 3000 degree refractory concrete with high resistance to spalling and low volume change throughout its operating range.

THE BABCOCK & WILCOX CO.
Refractories Division

General Offices:
161 East 42nd St., New York 17, N. Y.
Works: Augusta, Ga.

When inquiring check CP 3633 on handy form, pgs. 2-3

Pump- don't stop INDUSTRIAL LIQUIDS



Delivers on both back and forward strokes.

Alternate materials are available for special liquids.

You can build an effective barrier against fires and accidents, reduce maintenance costs and make a general improvement in housekeeping if you pump liquids from drums instead of pouring, drawing, siphoning or spigoting. If you use Tokheim pumps you may also be rewarded with lower insurance rates.

The wisdom of pumping seems obvious, doesn't it? And so desirable you'd think every factory would have such equipment. But the number of modern plants that still employ antiquated methods of liquid transfer is surprising.

These little Tokheim pumps are a valuable asset to any factory. They assure safe handling of liquids in small quantities — reduce spilling, slopping, over-filling, dripping, and practically eliminate slippery floors. Pump 20 gallons a minute. Available with hose or spout and optional parts for special liquids. Decide now to put Tokheims to work for you. See your dealer, your Tokheim representative, or write the factory.

TOKHEIM
DOUBLE-ACTION
HAND PUMPS

General Products Division
TOKHEIM CORPORATION
Designers and Builders of Superior Equipment
1690 Wabash Ave. Since 1901 Fort Wayne 1, Ind.
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Canadian Distributor: H. Reeder, 205 Yonge St., Toronto, Ont.

Gasoline Pumps and Accessories • Air and Liquid Dispensers • Specially Engineered Products

When inquiring check CP 3634 on handy form, pgs. 2-3

SAFETY

Explosion-proof conduit houses motor switch and relays . . .

switch automatically restarts motor after time delay

Uses: For minimizing processing interruptions due to low voltage or voltage failure in hazardous locations.

Features: Time delay feature on motor restarting switch permits automatic restarting after delays of 2, 4, or 6 seconds. Conduit and components are designed for use at Class I, Group D; Class II, Groups E, F, and G; or Class III hazardous locations.

Description: Interior electrical equipment includes push button switch, capacitor, rectifier, sensitive relay and control relay. Transformer for voltages of 220, 440, and 550 volts is also supplied.

Two terminal blocks, one for field connections and another marked for 2, 4, and 6 seconds, permit connection of one wire at proper time-delay post.

Body of device has vertical through-feed hubs for threaded conduit, one of which is equipped with removable pipe plug for either dead-end or through-feed wiring.

(Type OFC time delay station conduit is a product of Crouse-Hinds Co., Dept. CP, Wolf and 7th North Sts., Syracuse, N. Y. . . or for more information check Check CP 3635, pgs. 2-3).

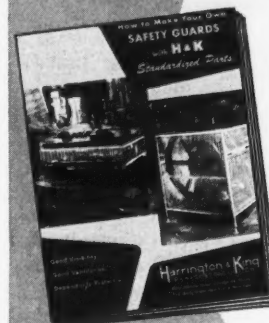
Provides data, specs on rupture discs

Series of 12 data sheets covers specifications and uses of rupture discs. Diagrams and tabular material cover design and dimensions of the frangible discs.

Data Sheets on rupture discs are issued by Frangible Discs, Inc., Dept. CP, 57 Railroad Ave., Penns Grove, N.J. Check CP 3636, pages 2-3.

Here is how to . . . Make Your Own SAFETY GUARDS

with
H & K
Standardized Parts



Write for your copy of this valuable bulletin

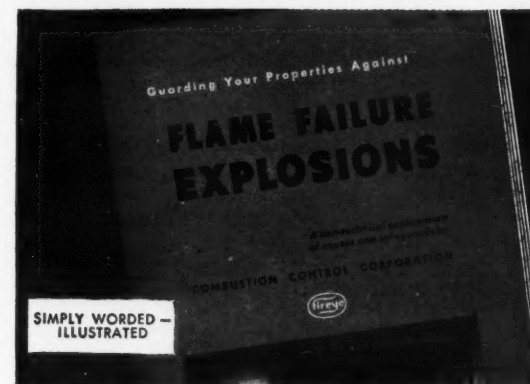
This bulletin illustrates a simple and inexpensive way of constructing your own guards for moving parts, such as: flywheels, gears, and belts, and for individual punch press dies. Only ordinary tools, such as a hack saw, hand snip, hammer and screw driver are needed. When properly constructed, guards made of sturdy H & K parts will comply with State and insurance requirements and will conform with American Standard Safety Codes.

Harrington & King
PERCUSSIVE CO.

5736 Fillmore Street, Chicago 44, Illinois
114 Liberty Street, New York 6, N. Y.

When inquiring check CP 3637 on handy form, pgs. 2-3

FREE! New Safety Information Process Engineers Need!



SIMPLY WORDED — ILLUSTRATED

IF YOU BURN oil, gas, powdered coal or other fuel, for power, processing or heating, the chances are 4-out-of-5 that you do not have complete safeguards against burner flame-failure explosions.

Why take chances . . . ? This new booklet gives you all the

information you need to prevent flame-failure explosions. With it you can spot burner explosion hazards in your plant — identify obsolete or inadequate "protective" devices — determine your needs for the most modern safeguard equipment. Get your copy, free! Please give your company name and title.

WRITE:

COMBUSTION CONTROL
DIVISION
ELECTRONICS CORPORATION OF AMERICA
Dept. C6-11, 718 Beacon Street
Boston 15, Mass.



When inquiring check CP 3638 on handy form, pgs. 2-3

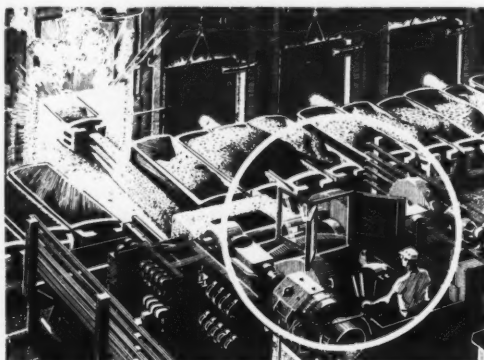
CHEMICAL PROCESSING

SAFETY

Protective windows of plastic withstand 350°F temp without loss of clarity . . .

plastic has high resistance to abrasion, hot spatter and chemical fumes and solvents

Protective windows made from a copolymer of allyl diglycol carbonate and triallylcyanurate have strong impact resistance and withstand exposure to 350°F temperature without loss of clarity or rigidity. Material is also reported to possess outstanding resistance to abrasion, hot metallic spatter and all types of chemical fumes and solvents.



Plastic windows used in steel plant do not lose clarity or flexibility even when exposed to high temperatures

Windows made of the high temperature resin are being used in the control cockpits of open-hearth furnace charging machines in plants of the National Steel Corporation.

Plastic material is also being used in observation windows on Detrex Corp's ultrasonic metal cleaning machine. It safely withstands chemical attack and hot, abrasive action of fast-moving metal particles. Tensile strength is 5800 psi.

Material is available in sheet form in standard thicknesses up to 1/2". It is intended for flat glazing applications and cannot be hot-formed.

(HT-CR-39 is a product of the Cast Optics Corp., Dept. CP, Riverside, Conn. . . or for more information check CP 3639, pages 2 and 3.)

Tells methods for checking overload relays

Test methods for checking overload relays are given in four-page technical paper authored by assistant plant engineer and electrical engineer of large plastics manufacturing company.

"Check Your Overload Relays" bulletin is available from Multi-Amp Corp., Dept. CP, 10 Third Ave., Newark 7, N. J. When inquiring specify CP 3640 on handy form, pages 2 and 3.

LOOK OUT FIRE!



TWO OF THE GREATEST NAMES IN FIRE PROTECTION HAVE JOINED FORCES

PYRENE and C-O-TWO, world-renowned manufacturers of approved fire protection equipment, are now unified under the same management to give you the finest and most complete line on the market today . . .

- ★ built-in fire detecting systems that quickly respond to smoke, heat or flame . . .
- ★ all types of portable fire extinguishers and built-in fire extinguishing systems that kill fire fast . . .
- ★ plus an expert fire protection engineering service that gives you unbiased advice on what is best for your particular fire hazards.

Don't take unnecessary chances . . . the combined fire protection experience of PYRENE and C-O-TWO over the years is at your disposal without obligation. Get complete facts today!



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Sales and Service in the Principal Cities of United States and Canada

COMPLETE FIRE PROTECTION

portable fire extinguishers . . . built-in fire detecting and fire extinguishing systems

CARBON DIOXIDE • DRY CHEMICAL • VAPORIZING LIQUID • SODA-ACID • WATER • CHEMICAL FOAM • AIR FOAM



When inquiring check CP 3641 on handy form, pgs. 2-3

OLIVITE Acid-Handling PUMP



Corrosion and leakage!
Two important questions
when considering chemical-
handling pumps.

Here's how the Olivite answers them:

CORROSION... the cast-iron casing, cover and impeller are protected by a heavy covering of OLIVITE, firmly bonded to the metal. It will not pull away or slough off. OLIVITE—a special rubber base plastic impervious to most chemicals, hot or cold, strong or weak. For special chemicals we have OLIVEX—a strong high tensile plastic of which the impeller is made for certain applications.

LEAKAGE... We employ three elements to prevent leakage and protect the shaft:
1) Floating Stuffing Box which constantly adjusts itself to the shaft;
2) Spring-Loaded Gland enabling the operator to easily keep the packing under proper pressure; 3) Removable Shaft sleeve which protects the shaft against corrosion as well as wear.

Even assuming that all acid-handling pumps have equal pumping efficiency—which they don't—your choice will focus on the pump that provides maximum protection against corrosion and leakage. At least, these two thoughts were important in the minds of a number of companies now operating 100 or more Olivites. Would you like to have us tell you more about these big Olivite installations?

Our OLIVITE Bulletin No. 308-R

In sending for your copy of this bulletin,
tell us about your pumping problem.

Olivite Sizes 1 1/4, 2 and 4 inch; Direct or V-belt drive.

NEW YORK 36—33 West 42nd Street • CHICAGO 1—221 North LaSalle Street
OAKLAND 1—2900 Glacock Street • SAN FRANCISCO 11—260 California Street

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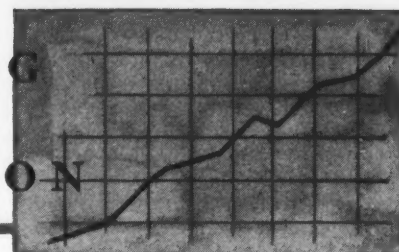
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EXPANDING CHEMICAL PRODUCTION



Ammonium phosphate plant scheduled for West Coast

Construction is under way on new ammonium phosphate plant at Brea, California by Brea Chemicals, Inc., subsidiary of the Union Oil Company of California. Target date of completion for the installation is the latter part of September. Totally soluble phosphoric acid will be mixed with aqua ammonia to form an ammonium phosphate solution. Destined for agricultural use, the solution will be a stable, non-corrosive liquid that can be safely and easily handled and applied in the same equipment now used for distribution of aqua ammonia.

Ammonium phosphate is the second largest tonnage plant nutrient in the West. Brea Chemicals is already supplying nitrogen, the largest tonnage plant nutrient, in the form of aqua ammonia from its new multi-million dollar Brea ammonia plant.

Food Machinery & Chemical buys pesticide works

Food Machinery & Chemical Corp. has purchased National Distillers Products Corporation's USI Fairfield, Maryland (near Baltimore) plant. Production units and pesticide business of National's USI Division of Food operated as a separate division of Food Machinery & Chemical Corp. Fairfield plant manufactures pyrenones, piperonyl butoxide, pyrethrum, allethrin, grain protectants.

Food Machinery & Chemical buys Chicago Pump Co.

Chicago Pump Company, producer of sewage treatment and disposal equipment and

specialty pumps for building services, has been purchased by Food Machinery & Chemical Corp. Acquisition of the company complements FMC's regular line of industrial and agricultural pumps with a line of specialized equipment in the waste disposal and building fields. As a subsidiary of FMC, Chicago Pump Company will be an operational component of the parent corporation's Peerless Pump Division.

Ammonium nitrate works on stream in Kansas

Large-scale ammonium nitrate plant, owned by the Cooperative Farm Chemicals Association, was recently dedicated. Cost of the project, including the ammonia plant, is approximately \$15 million.

Ammonia will be converted to ammonium nitrate prills and nitrogen solutions in a 330 ton per day plant designed and constructed by The Girdler Company, a division of National Cylinder Gas Company. Installation is located on a 374-acre site southeast of Lawrence, Kansas.

Work under way on plant for Sinclair Chemicals

Sinclair Chemicals, Inc., a subsidiary of Sinclair Oil Corporation, has started construction of a petrochemicals producing plant at its Marcus Hook refinery. Unit will produce 18,000,000 gallons per year of pure aromatic hydrocarbons including toluene, xylenes and para-xylene. Feedstock for the entire petrochemical operation will be secured from Sinclair's new multi-million dollar catalytic reforming unit at the 100,000-barrel-a-day refinery.

When inquiring check CP 3642 on handy form, pgs. 2-3

**Eagle-Picher's H_2SO_4 plant
now in operation**

Galena, Kansas, plant of Eagle-Picher Company has 300-ton-per-day sulfuric acid unit on stream. Bulk of the plant's output is being used by a nearby company to make phosphate fertilizers.

Sulfuric acid unit uses sulfur dioxide gas produced by the roasting of zinc ores. Gas is converted by contact process to sulfur trioxide, which is absorbed to give sulfuric acid.

**Reichhold Chemicals to build
Canadian chemical works**

Phthalic anhydride plant will be built near Montreal, Canada by Reichhold Chemicals, Ltd., Canadian subsidiary of Reichhold Chemicals, Inc. The \$750,000 plant will produce four million pounds annually. Plant's output will be shared between Canadian domestic market and other Reichhold plants requiring phthalic anhydride to make alkyl resins.

**Glidden starts work on plants
for TiO_2 and H_2SO_4**

One of the largest titanium dioxide and sulfuric acid plants in the world is being constructed by the Glidden Company on a 100-acre site in Baltimore. First of three units of the huge installation, which alone will cost \$10 million and cover 25 acres, is scheduled for completion in December, 1955. Sulfuric acid manufactured at the works will be used in production of titanium dioxide.

**National Lead building plant
to up production of TiO_2**

New facilities for manufacture of titanium dioxide are under construction at the St. Louis operations of National Lead Company. By the end of 1955 (when plant is in full operation) yearly capacity will be in neighborhood of 36,000 tons of TiO_2 . Plant has been designed so production of either calcium-base or pure pigment can be switched at will to meet changing market conditions.

**Allied's NH_3 plant at Omaha
to double capacity**

Nitrogen Division of Allied Chemical & Dye Corp. has announced plans to double the ammonia capacity of its new plant at Omaha, Nebr. Works went on stream in April. Construction of new facilities will begin as soon as necessary supply of natural gas for raw material has been assured, according to Hugo Riemer, Nitrogen Division's President. Present units of the plants have an annual capacity of 61,000 tons of nitrogen.

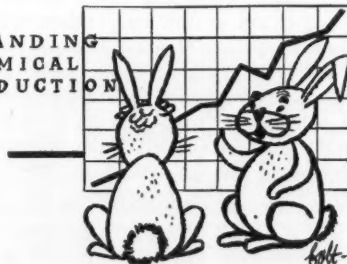
**By-product carbon dioxide
used to make dry ice**

Lion Oil Company is utilizing by-product stream of carbon dioxide from its Barton, Va. ammonia synthesis works. Portion of stream is being used to produce dry ice and liquid carbon dioxide. CO_2 gas, recovered from ammonia synthesis operations by use of ethanolamines, is liquefied by compression and refrigeration. Recently-opened dry ice plant was engineered and erected by The Girdler Company, Chicago.

**Nitrogen plant of Deere & Co.
now producing NH_3 and urea**

New \$20 million nitrogen plant of Deere & Company at Pryor, Oklahoma, is now on stream with anhydrous ammonia and fertilizer grade urea. Rated daily capacity of unit is 180 tons of ammonia, most of which will be used for producing fertilizer, feed, and (in the spring of 1955) technical grade urea.

EXPANDING
CHEMICAL
PRODUCTION

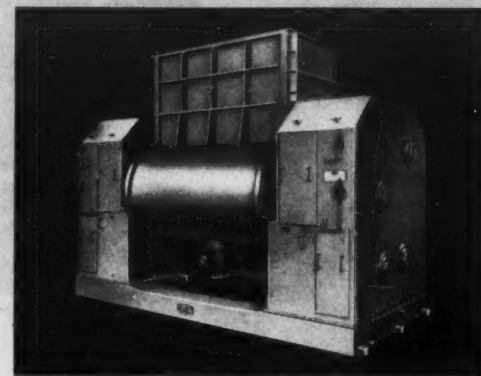


"Know anything about chemicals, Mathilda?"



IN THE Paper Industry

*Read
Standard
supplies
leading
manufacturers
with the
equipment
they need
for rapid
dispersion of
ingredients
in preparation
of high
density
coatings*

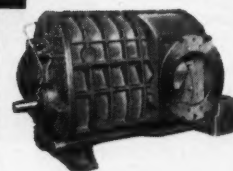


The Unique bowl construction of Readco Mixers greatly multiplies their effective mixing areas . . . reducing the length of the mixing cycle and resulting in consistently high rates of production. For complete information, write to Bakery-Chemical Division, York, Pennsylvania.

READ STANDARD
CORPORATION

BAKERY-CHEMICAL DIVISION
York, Pennsylvania
Los Angeles 39, California

Read Standard also manufactures a complete line of positive displacement Blowers and Vacuum pumps for industrial use. For information write, Read Standard Corp., York, Pennsylvania.



When inquiring check CP 3643 on handy form, pgs. 2-3

AVAILABLE



for any gas scrubbing, cooling or absorption problem...

Peabody installations in Alaska, Canada, Mexico, Venezuela, Brazil, Chili, Peru, Japan, Argentina, Colombia, Union of South Africa, Belgian Congo, England, Holland, France, Spain, Italy and throughout the United States include:

Scrubbing tail gas from carbon black plants,
—at 97% to 98% efficiency—

Scrubbing vented gas from rotary lime kilns,
—at 98% efficiency—

Scrubbing gas from ore roasting operations,
—at 99% efficiency—

In many cases where cool gases are required for process work, the cooling and cleaning can be handled simultaneously by the same piece of equipment without sacrificing scrubbing efficiency and with low water usage. If you have a problem of scrubbing, cooling, or absorbing gases, look to Peabody for a job-engineered solution.

For descriptive literature, write for Bulletin 203B

PEABODY
ENGINEERING CORPORATION

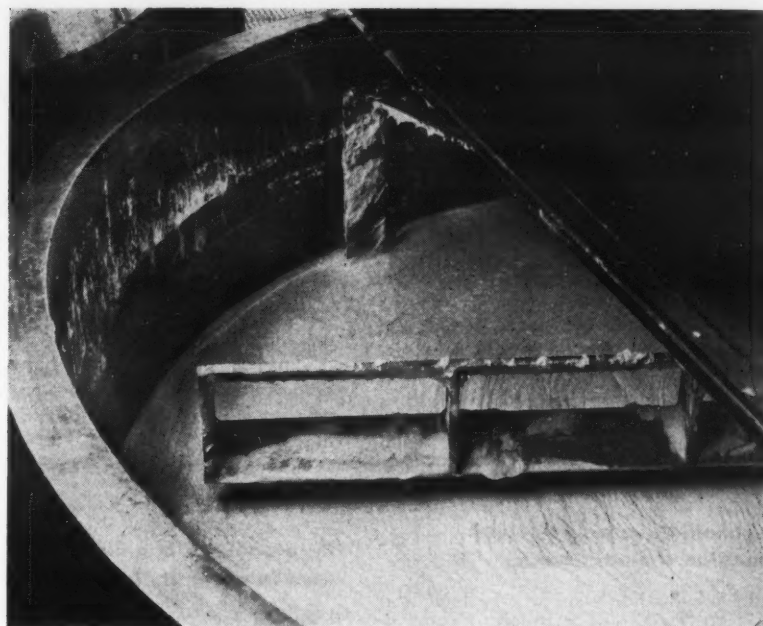
580 FIFTH AVENUE • NEW YORK 36, N. Y.
Manufacturers of all types of combustion equipment, direct-fired air heaters, gas scrubbers, coolers, and absorbers.

OFFICES IN PRINCIPAL CITIES

PEABODY LIMITED • LONDON, S.W. 15, ENGLAND

When inquiring check CP 3644 on handy form, pgs. 2-3

processing equipment



Purity of shaving cream is assured, any possibility of contamination by walls of vessel being eliminated by stainless steel construction

Use of stainless steel kettles at Mennen —

cuts shave-cream processing time

Only eight hours instead of twelve is required for a larger size batch. Drainage and mixing are improved, and cleanliness of product made doubly sure

GEORGE D. HARRISON, Production Manager
The Mennen Co., Morristown, N. J.
with GORDON WEYERMULLER, Associate Editor

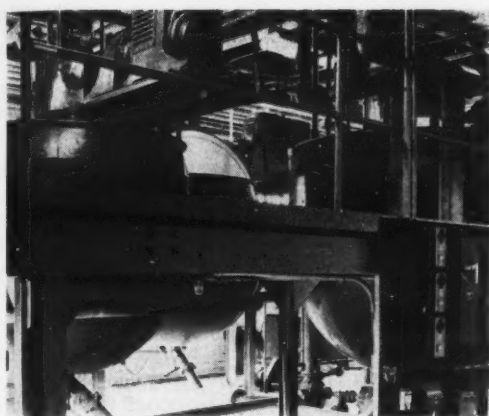
Problem: Twelve hours was required to manufacture and cool a batch of shaving cream in iron soap crutchers formerly used at The Mennen Company, Morristown, N. J. In addition to slow reaction and cooling time, vertical sides of the dish-bottom vessels made it difficult to clean all of product from the walls and provide adequate drainage.

Raw materials as received were loaded into crutcher. All of the reaction in the process of forming soap was effected in vessel.

Heat of reaction was supplemented by live steam at about 40 psig. Upon completion of reaction in crutcher, batch was cooled prior to removal to a storage tank. Last step was filling operation.

A reversible worm-type agitator operated in the center of the crutcher on a vertical shaft. Agitator had only one speed forward and one reverse. Steam or cool water could be run through the outer wall of vessel as well as inner draft tube in center for purpose of heating or cooling.

Solution: Five 1000-gal stainless steel kettles were placed in operation manufacturing and cooling shaving cream in June of 1953. As shown in accompanying photographs, vessels are hemispherical. They



Hemispherical shape of kettles provides efficient heating and cooling, while allowing complete drainage through flush-type valve in bottom

have scraper-type agitators, which are variable in speed. Heating and cooling are effected by passing steam or cold water through jacketed wall.

Results: Time required to manufacture and cool a batch is approximately eight hours instead of twelve. Batch size is now 6000 lb instead of the previous 5000 lb.

Hemispherical shape of kettle provides efficient heat transfer and allows complete drainage of batch through a flush-type valve located at bottom in center of vessel. Since agitator acts as a scraper, product is removed from wall as agitator turns. Method of agitation makes mixing more complete and effects a pickup in speed of heating and cooling. Variable-speed drive has been found to be of advantage as viscosity of product changes during manufacture.

Since stainless steel construction eliminates any possibility of contamination by kettle wall, a high quality product is assured. Vessels have required a minimum of maintenance since they were placed in service.

(Stainless steel kettles are manufactured by Lee Metal Products Co., Inc., Dept. CP, 417 Pine St., Philipsburg, Pa. . . . or for more information check CP 3645 on handy form, pages 2 and 3.)

For a guide to processing ideas . . .

You'll find what you need in the handy Product Directory on pages 213 to 216. All products and processes are listed there.

the *Complete* line of Reineveld Centrifugals is now available through Heyl & Patterson



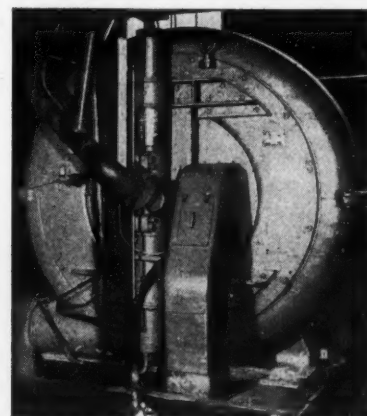
No matter how difficult your separating or drying problem may be . . . whether you require large or small capacity, very high or relatively low centrifugal force, perforated basket or solid bowl . . . you'll find the answer to your problem in the *complete* line of Reineveld Centrifugals.

The Reineveld Centriplane . . .

is a vertical perforated basket centrifugal designed for continuous operation. The standard models of the Centriplane have bowl diameters of 8", 16" or 25", the use of each size depending upon the material being processed and the tonnage required. The Reineveld Centriplane is especially advantageous on quick-draining materials such as ammonium sulphate, Glauber salt or wherever else CONTINUOUS operation is best applied.

The Reineveld Horizontal-Basket Centrifugal . . .

uses either a perforated basket or solid bowl. This is an automatic batch-type machine ranging in drum size from the 16" laboratory or pilot plant model to the 100" double-basket model. In addition to its use on quick-draining materials the Reineveld horizontal-basket Centrifugal gives outstanding performance on products that are difficult to de-water.



Heyl + Patterson, Inc.

"SINCE 1887"

55 FORT PITT BLVD. PITTSBURGH 22, PA.



When inquiring check CP 3646 on handy form, pgs. 2-3

What's New in Gaulin Homogenizing

LATEX THREAD—Gaulins make it smoother, more uniform...improve dip and extrusion characteristics.

LIQUID STARCH—A Gaulin improves transparency, clarity and stops separation at a cost far below conventional methods.

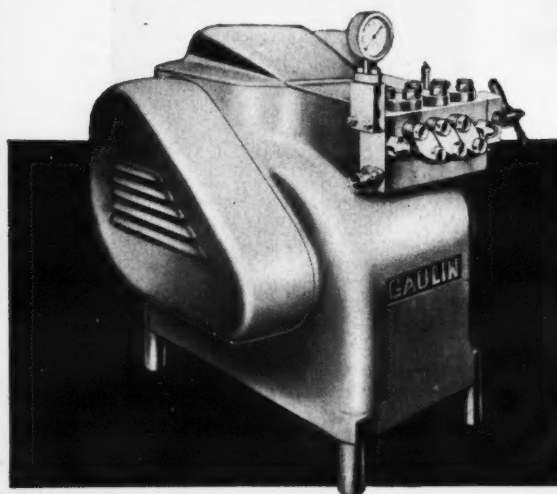
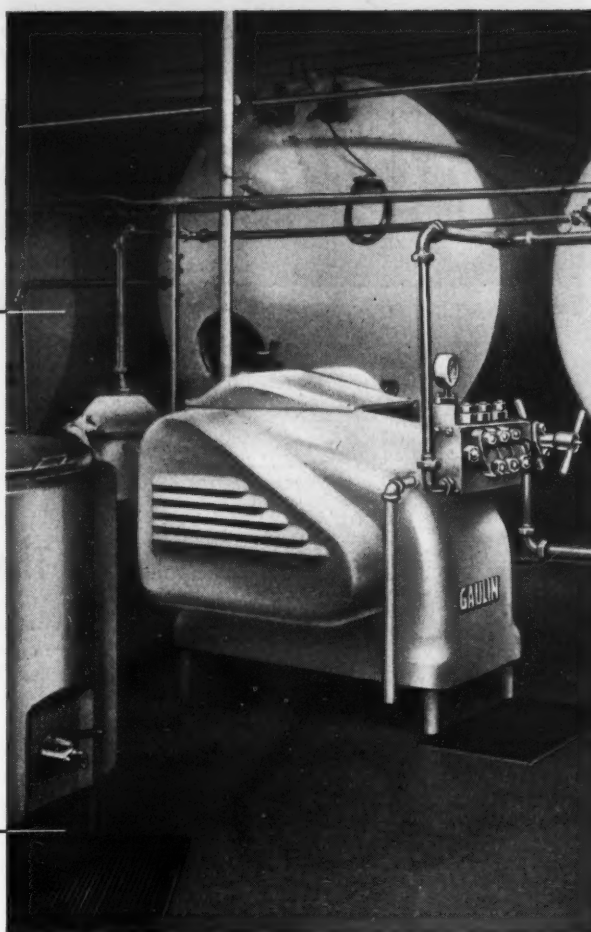
GREASE—Improves lubricating value and stability. Increases service life.

ESSENTIAL OIL EMULSIONS and Spiced Flavors have controlled uniformity plus added taste because maximum surface area is obtained from each particle.

COSMETIC EMULSION—Gaulins give it a smoother texture, longer shelf-life. Perfume is locked-in against evaporation.

WAXES—Provides more uniform, stable emulsions and convenient viscosity control.

SEND FOR BULLETIN I-53 on how Gaulin Homogenizers can work for you.



**GAULIN PILOT PLANT
HOMOGENIZER**

Ideal for experimental purposes, operation or process requiring up to 25 gallons per hour capacity. Handles quantities as small as one pint. Available on low rental basis.



**GAULIN TWO-STAGE
COLLOID MILL**

Stator is jacketed for cooling or heating. Gap setting adjustable for .001" to .045", three models up to 600 GPH capacity. Only seconds clean-up required in changing colors. 12" x 17" floor area.

What's New in High Pressure Pumping

Gaulin Triplex, Stainless-Steel, High Pressure Pumps are cutting operating costs in a wide variety of applications. In moving viscous materials...in handling highly corrosive or abrasive materials...in spray drying...in transfer applications...in metering... Gaulins provide *more capacity, with less maintenance* on your part. For full facts write for Bulletin I-53.



Manton-Gaulin
MANUFACTURING COMPANY, INC.

55 GARDEN STREET, EVERETT 49, MASS.

World's largest manufacturer of Homogenizers, Triplex Stainless-Steel High Pressure Pumps, and Colloid Mills

When inquiring check CP 3647 on handy form, pgs. 2-3

PROCESSING

Constant quality CO₂ assured by dry ice converter...

1000-pound-capacity unit stores 8700 cu ft of gas

Uses: For converting solid blocks of commercial dry ice into liquid or gaseous carbon dioxide, and storing same.

Features: Quality of gas from converters is constant. Gas is available as soon as connections are made. Without use of heat, freshly charged converter will reach room temperature in about 12 hours. For more rapid liquefaction, auxiliary equipment such as electric heaters or hot water spray manifolding can be used.

Description: Full 50 lb blocks of dry ice are inserted into cylinder. Unit is sealed and dry ice begins to convert to liquid-gaseous state. Either gas or liquid may be withdrawn.

Converters come in four sizes: 300, 600, 750, and 1000-lb capacities. Units can be installed vertically or horizontally. Large converter stores about 8700 cu ft of gas which can be withdrawn at rates up to 900 cfh. While storing gas, unit requires no attention. Converters are built to ASME specifications.

(Dry ice converters are product of Dry Ice Converter Corporation, Dept. CP, Box 1652, Tulsa, Oklahoma... or for more information check CP 3648 on handy form, pages 2 and 3.)

Heat transfer surfaces kept clean in evaporator by revolving steel wipers...

leave thin, turbulent film on heating surface which helps speed evaporation

Uses: Distilling water, concentrating solutions, extracting solids from solutions, and (with some modification) vacuum drum drying and circulation drying.

Features: Revolving stainless steel wipers prevent scaling, maintain clean heat transfer surfaces, and help speed evaporation.

Description: Capacities range from 65 lb/hr (distillate) pilot model to 6000 lb/hr model. Special designs are available for processing larger quantities. Power requirements are approximately 8 kwh per 1000 lb distillate (125 lb/kwh), plus small amount of make-up heat in specific applications.

Evaporator consists of six major components: boiler shell of corrosion-resistant plates in which evaporation takes place; bank of evaporating-condensing diaphragms of welded stainless steel located inside boiler; twin rotating wipers placed between diaphragms, also made of stainless steel; compressor, impervious to steam vapors or substance being treated;

PROCESSING

control panel for automatic operation; and, where required, heat exchangers.

Feed solution is introduced hot into shell side of evaporator. Diaphragms are separate from one another and connected only by manifolds through which steam is admitted and distillate and non-condensable gases are removed. Outside of diaphragms are kept clean and scale-free by means of wipers attached to rotating arms. Wipers also create a highly turbulent film of liquid, which speeds evaporation on heating surface. Wiper arms are driven by electric motor mounted outside shell.

Vapors from solution being evaporated are taken off, passed through a pump and sent through diaphragms as heating steam. Outside steam connection is required to start unit and maintain exact heat balance in system. Compressor serves to create pressure differential in system either at atmospheric pressures or below with corresponding temperature differential needed for heat transfer.

Units are available in stainless steel or other corrosion-resistant materials. Diaphragms, wipers, and other parts are standard in design and are interchangeable.

(Sebavo self-cleaning evaporators are product of Roots-Connersville Blower Corporation, Division of Dresser Industries, Inc., Dept. CP, 900 W. Mount Street, Connersville, Indiana . . . or for more information check CP 3649, pages 2 and 3.)

Only 1 1/2 sq ft of floor space occupied by granulator . . .

self-contained unit caster-mounted for mobility

Uses: Applicable to broad field of granulating, ranging from plastics to leather, food and waste.

Features: Granulator is self-contained in 1 1/2-square-foot floor space, caster-mounted for mobility and ease of handling.

Description: All-steel machine is ruggedly mounted with supports on both ends. Hardened end seals guard welded cutting chamber to assure long life. Rotor is also hardened to give extra strength. Granulator's design is such that there is no flyback of material being processed. Specially engineered conveyor permits refeeding of granulated material.

Unit has 4 1/2" x 6" throat opening, is 53" high, and measures 26" from base to throat. A 1 1/2-hp motor is recommended for use with machine. Other models are available ranging up to 9" x 24" throat opening, using 40 hp motor. Dicing and chopping equipment is available as attachments to all models.

(Granulators are product of Al Steele Engineering Works, Inc., Dept. CP, 82 Herbert Street, Framingham, Mass. . . . or for more information check CP 3650 on handy form, pages 2 and 3.)



Rx: to relieve Quality Control "headaches"...
BLEND MATERIALS IN SIMPSON MIX-MULLERS!



MULLING GIVES YOU POSITIVE CONTROLLED RESULTS

Watch the practiced technique of a chemist's mortar and pestle—the intensive rubbing and smearing actions—and basically, THAT'S MULLING!

Mulling with a SIMPSON Mix-Muller utilizes a special pair of revolving mullers and plows mounted on a stationary pan. The mullers are adjustable and are supported by rocker arms. This leaves them free to ride on the material, creating a true mulling action as they revolve. The results are thorough, more rapid blending.

If you are having quality control "headaches," it will pay you to take a good close look at your *mixing* operations. Experience has shown that improperly mixed materials can often be the cause of inferior end-products or processes.

The type of mixing equipment you use is, of course, the secret to properly controlled mixing. When you use Simpson Mix-Mullers, you are assured of complete control at all stages of mixing . . . with uniformly blended batches that will be the same—day in, day out—as proved by hundreds of successful applications throughout the chemical process, food and ceramic industries.

Built in twelve basic models, in capacities from 1/10 to 60 cu. ft., Simpson Mix-Mullers all give you the time-tested mulling principle of controlled mixing, with emphasis on improved quality at lower mixing cost.

Let a National Engineer show you how these versatile Mix-Mullers can help solve your particular mixing problems. Write for details.



SIMPSON MIX-MULLER® DIVISION

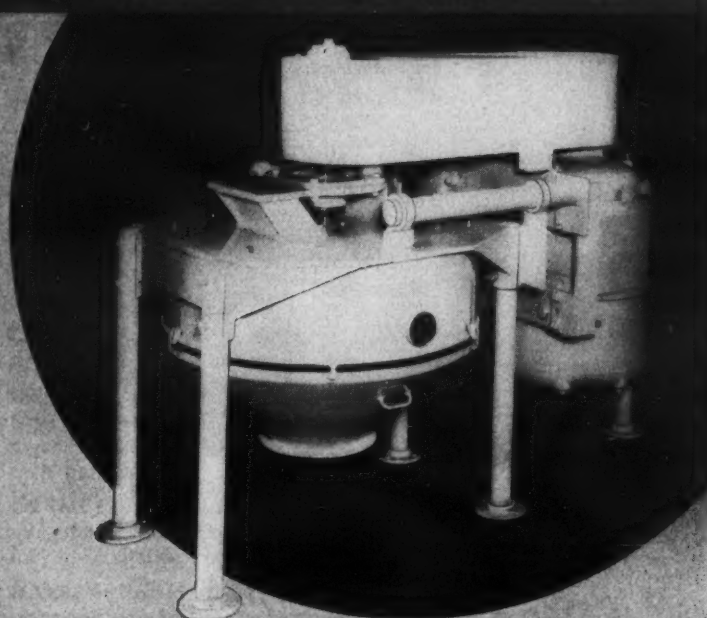
NATIONAL ENGINEERING CO., 640 Machinery Hall Bldg., Chicago 6, Ill.
(Not Inc.)



When inquiring check CP 3651 on handy form, pgs. 2-3

THE "ENTOLETER" IMPACT MILL

The most versatile machine
available to chemical processors



...as a GRINDING MILL & MIXER, the "ENTOLETER" Impact Mill has the greatest capacity per HP and per unit of space now available to the Chemical Processing Industries.

...engineered to meet the widest range of product characteristics and flow requirements.

...metal oxides... sugar... vinyl... fertilizer... plastic color... are now being processed on this equipment for improved product results.

...requires minimum floor space... may be floor mounted... suspended from above... easily adjusted to any height. Available in a wide range of sizes, capacities and metals to meet specific conditions. New applications for the "ENTOLETER" Impact Mill are being developed continually in our laboratory. Let us process a sample for you, without cost, and return it to you for your evaluation.

Write for these Bulletins, describing "ENTOLETER" equipment for the process industries.

Bulletin 4724 — "ENTOLETER" Impact Mills
Bulletin 4556 — Simon Suction Filter Dust Collectors
Bulletin 4507 — "ENTOLETER" Centrifugal Pumps

The trademark
"ENTOLETER" is
your guarantee
of complete
satisfaction

ENTOLETER DIVISION
The Safety Car Heating and Lighting Company, Inc.
1169 Dixwell Ave., New Haven 4, Connecticut

When inquiring check CP 3652 on handy form, pgs. 2-3

PROCESSING

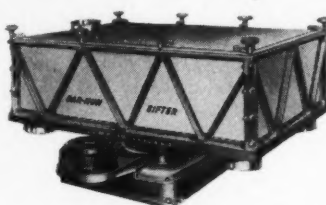
**No rods, supports used
for carrying sifter box
on rotary unit . . .**

four-point drive imparts uniform motion over screen area

Uses: Designed to meet requirements of process plants for an efficient low-head, high-speed, dust-tight, easily-cleaned sifter or grader.

Features: Four-point drive eliminates need for rods or flexible supports to carry sifter box. Device imparts uniform, single-plane, rotary motion over screen area in operation.

Description: Rotary sifters are self-contained units, furnished complete with motor and V-belt drive with provision for belt take-up. Dust-tight sifter box is constructed



Sifters are made with sieve areas ranging from two to 56 sq ft

of cast aluminum frames, reinforced to carry full stress and centrifugal thrust imposed by rotary motion. Side panels are of aluminum or stainless steel sheets, laminated to the aluminum frame.

Sieve frames are removable for cleaning or washing. Frames are available in wood, wood with metal lining, or all-metal construction and may be clothed with wire, silk, or nylon. Either level or inclined sieves can be furnished, with or without flights.

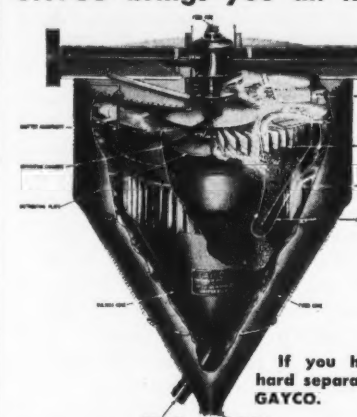
Four series of models are available with sieve areas ranging from two to 56 square feet.

(Bar-Nun rotary sifters are product of B. F. Gump Company, Department CP, 1325 South Cicero Avenue, Chicago 50, Illinois . . . or for more information concerning the product reader may simply check CP 3653 on the convenient Reader Service slip which is located between pages 2 and 3.)

GAYCO CENTRIFUGAL SEPARATORS

GAYCO Separators, equipped with the adjustable centrifugal sizing fan — an exclusive GAYCO feature — make closer separations. Closer separations bring about higher production through efficient removal of the fines made by the mill. Closer separations bring about higher quality products by eliminating all undesirable oversize.

"TIMKEN BEARING EQUIPPED"
GAYCO brings you all these:



Range 60
to 400 mesh
greater
capacity
25 to 30%
greater
production
Cleaner
Tailings
Uniform
Products
Slow speed for
slow wear
Quick and easy
adjustments

If you have an exceptionally
hard separating problem, TRY THE
GAYCO.

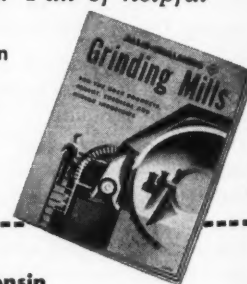
Universal Road Machinery Co.

Robert M. Gay-Division
Factory and Laboratory, Kingston, N. Y.
117 LIBERTY STREET NEW YORK 6, N. Y.
Canadian Representative: F. H. Hopkins & Co., Ltd.,
8500 Decarie Blvd., Montreal, Que.
When inquiring check CP 3654 on handy form, pgs. 2-3

Get Complete Facts On... **ROD MILLS**
BALL MILLS
PEBBLE MILLS

Write for this useful 44 page book,
bulletin 07B6718A. Full of helpful
facts on:

- Grinding media action
- Mill applications
- Wet vs dry grinding
- Grinding circuits
- Critical mill speeds
- Grindability indices



ALLIS-CHALMERS
Milwaukee 1, Wisconsin

Company.....
Attention of.....
Address.....
City.....State.....A-4300

ALLIS-CHALMERS



When inquiring check CP 3655 on handy form, pgs. 2-3

CHEMICAL PROCESSING

PROCESSING

**Hazardous, tough dusts
are easily handled by
wet collector . . .**

air and water vigorously mixed
by centrifugal action

Uses: Designed especially for tough dust control problems such as exist under following conditions:
1) high temperature or moisture,
2) explosive or combustible dusts,
3) corrosive, highly abrasive or obnoxious dusts, 4) combinations of the above.

Features: Vane design provides increased impingement surface and imparts vigorous centrifugal action to both air and water — producing thorough intermixing and preventing channeling.

Description: Collector CW-1 consists essentially of a series of circular vaned sections, equally spaced, mounted one above the other inside a vertical tower. Top section is water entrainment section and those below are wet impingement sections.

Collectors are made with inside diameters ranging from 3 to 8 ft, in 6 inch increments. Height is governed by number of vaned sections required for specific application.

Water enters near top of tower (immediately below water entrainment section) through an open end pipe. As water flows downward through vaned sections, it vigorously mixes with the upcoming dust-laden air, which enters unit through tangential inlet at bottom.

Clinging together, water and dust are discharged as sludge through tower's conical bottom. Clean air leaves at top.

Since no spray nozzles are used, water may be recirculated after clarification in settling tanks.

(Wet collector is product of Pangborn Corporation, Dept. CP, 286 Pangborn Blvd., Hagerstown, Md. . . or for more information check CP 3656, pages 2 and 3.)

For more information on product at right, specify CP 3657 . . . see information request blank between pages 2 - 3.



Fig. 1612

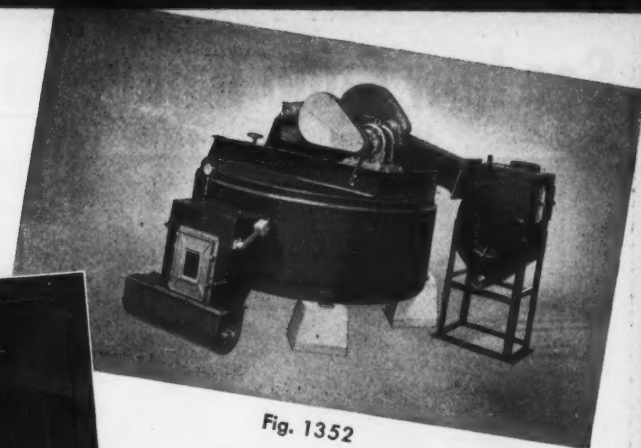


Fig. 1352

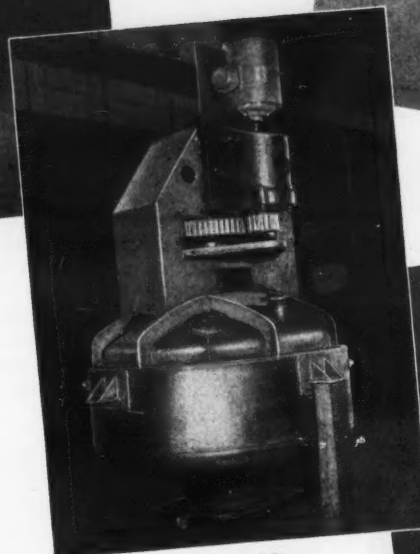


Fig. 1599

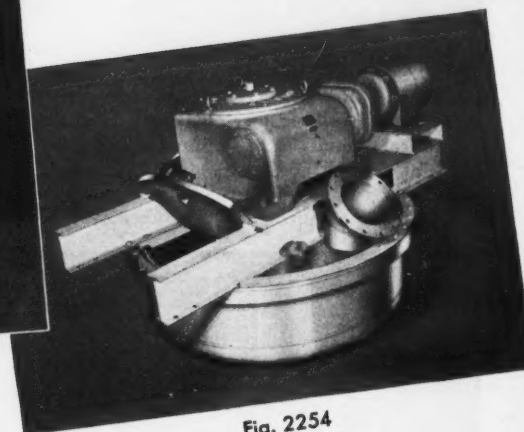
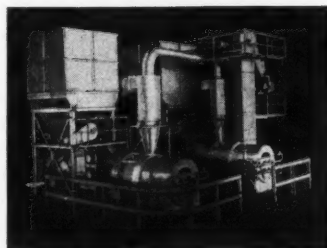


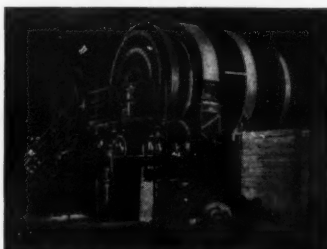
Fig. 2254

**Individually
designed and
custom built**

for Unusual Requirements



Two Complete Drying Systems, Can Be Operated Together—or Singly—to Meet Varying Plant Requirements.



Two Bartlett-Snow Batch Rotary Kilns, Preheating Charges for Electric Furnaces.

• Our wide experience and complete developmental, engineering, fabricating and erecting facilities enable us to solve the most unusual and exacting heat processing problems. Mild steel, stainless or special alloys.

The dished bottom stainless steel batch dryer (Fig. No. 1612 above) dries a finely divided catalyst with minimum dust loss. The liquid tight plug type discharge doors are opened and closed with remote control. Fig. No. 1599 is a steam jacketed dryer-crystallizer. Note the powerful drive and reducer. Fig. No. 1352 is a steam jacketed dryer fitted with a condenser where fines are reclaimed from the vapors. Fig. No. 2254 is a special stainless steel vessel for processing a catalyst used in defense activities. All the above units conform to A.S.M.E. U-69 unfired pressure vessel code. Don't gamble. Let us work with you on your requirements.

DESIGNERS

ENGINEERS

**BARTLETT
B-SNOW**
CLEVELAND 5, OHIO

FABRICATORS

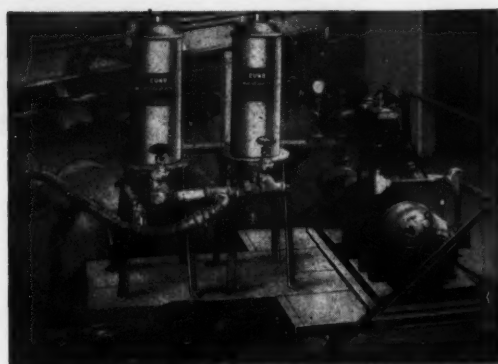
ERECTORS

Dryers • Coolers • Calciners • Kilns
"Builders of Equipment for People You Know"

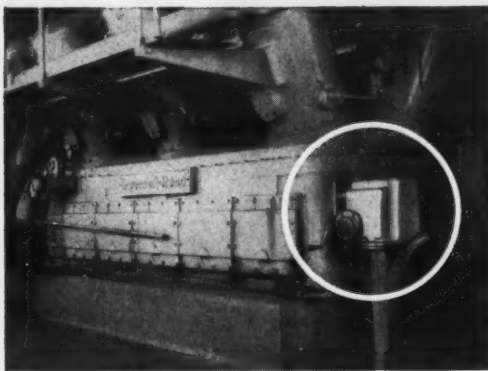
See how Cuno handles any filtration problem



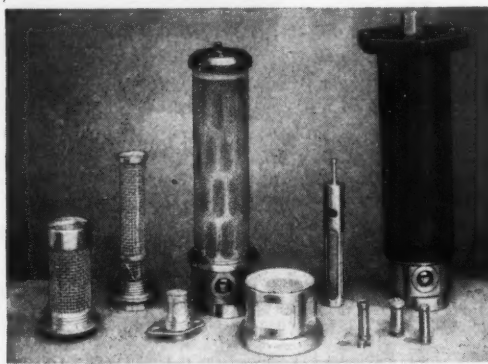
10,000 gallons of water per minute are filtered by six of these Cuno FLO-KLEAN filters, used to remove sand and gravel from incoming well water at pharmaceutical plant. Plant records show that the FLO-KLEANS, by protecting valves and pumps from wear caused by sand, are responsible for saving up to \$2000 per month in maintenance costs.



Paints and enamels. This Cuno MICRO-KLEAN installation filters enamel being pumped from storage tanks to shipping containers. This micron media provides finer filtration at lower costs for chemicals, oils, gases, water and many other liquids. Records show that the MICRO-KLEAN element lasts twice as long as ordinary cartridges.



Lubricating oil for modern 600 hp gas compressor is thoroughly strained by four Cuno AUTO-KLEAN filters. The continuously cleanable all-metal AUTO-KLEANS are specified as standard equipment by leading manufacturers of Diesel engines, compressors, pumps, machine tools and other heavy-duty machinery.



Screens. Cuno makes a complete line of both electrolytically formed and woven screen strainers designed to be built into your product. The electrolytically formed screens are available in nickel; the woven screens of steel, brass, copper, stainless and other alloys are provided in all standard variations of weave.

• We're really proud of our growing list of satisfied customers, like Buda, Bullard, Consolidated Paper, Du Pont, Ingersoll-Rand, Pratt & Whitney, Sherwin-Williams and others who use Cuno filters for anything from acids to tar. They know that if it can be pumped, Cuno can filter it.

We'd like to know about your filtration problem, too. Write for free analysis questionnaire. Cuno Engineering Corporation, Dept. 1634, Meriden, Conn.

PROCESSING

Describes processing equipment and applications

Pressure filters, ion exchangers, centrifugal pumps, heat exchangers, and rubber lining and covering services for corrosion prevention are described in 16-page illustrated catalog. Complete with photographs, drawings and tables, booklet lists specifications, and use and application data.

Cat CEC-55 is issued by The Industrial Filter and Pump Manufacturing Company, Dept CP, 5900 Ogden Avenue, Chicago 50, Illinois. When inquiring specify CP 3659, pages 2 and 3.

Water gets complete treatment in compact plant . . .

operation simple, needs only part-time watching

Uses: For treating water in plants or small communities.


Features: Compact plant is reported to be low-cost and includes all necessary equipment. Operation is relatively simple, requiring only part-time supervision of a non-technical operator.

Description: Heart of plant is Graver reactivator, a cold-process water-treating unit for selective or simultaneous removal of turbidity, color, organic matter, taste and odor, iron and manganese, and hardness from water supplies. Reactivator is self-contained, high rate unit of solids-contact type, embodying within single compartmented tank all functions of coagulations, flocculation, sedimentation, and sludge removal. Detention time is 60 to 90 minutes.

Rapidity of treatment is due to "seeding" process incorporated in reactivator. Process involves continuous recirculation of a substantial concentration of previously formed precipitates through zone in which raw water and chemicals are added. Suspended particles act as seed to which newly formed precipitates adhere. Speed-up of formation of settleable solids reduces retention time required for good settling and eliminates need for large sedimentation basins used in conventional plants.

Package-type plant includes clearwell, chlorinator, wet or dry chemical feeders, and proportioners, gravity or pressure filters, recarbonator when required, level and flow controls and instruments, and interconnecting piping. Standard layouts are available in wide selection of capacities from 0.1 to 2.0 MGD, special layouts being available for larger capacities.

(Packaged water treatment plants are product of Graver Water Conditioning Company, Dept. CP, 216 W. 14th Street, New York 11, New York . . . Check 3660, pages 2 and 3.)



CUNO

ENGINEERED FILTRATION

Removes More Sizes of Solids From More Kinds of Fluids

AUTO-KLEAN (disc-type)

MICRO-KLEAN (fibre cartridge)

FLO-KLEAN (wire-wound)

When inquiring check CP 3658 on handy form, pgs. 2-3

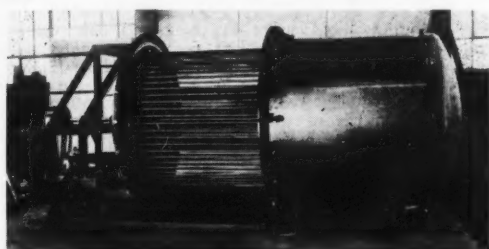
**Precise temperature control obtained
in completely closed-system
dyeing machine . . .**

sampling, dye additions made through pressure locks so conditions remain unchanged

Uses: Dyeing cotton, wool, and synthetic fabrics.

Features: Completely closed system permits precise control of temperature. Uniform dye distribution is facilitated by rotary action and constant agitation of bath.

Description: Barotor is an open-width piece-goods dyeing machine capable of processing at temperatures greater than 212°F. Many fabrics can be



Dyeing machine opened for loading. In operation, uniform dye distribution is facilitated by rotary action

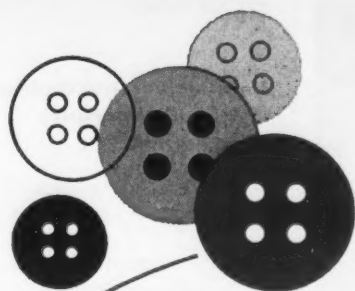
handled, including synthetics often difficult to dye by conventional methods. Fabric runs at full width, the most favorable condition for eliminating rope and crack marks.

Minimum tension in warp direction reduces stretching. Color, uniformity, and evenness are said to remain excellent though dyeing cycles are shortened. Test sampling and dye additions are made through pressure locks so that no physical conditions are changed during operation.

Live steam distributed beneath a false bottom produces temperature and pressure desired for dyeing. Sealed operation and precision controls make it possible to duplicate conditions from lot to lot. Significant improvements in quality and reduction in costs are reported with machine.

(Barotor is product of Rodney Hunt Machine Company, Dept. CP, 273 Maple Street, Orange, Mass. . . . or for more information check CP 3661 on handy form, pages 2 and 3.)

Recirculated cooling water becomes concentrated in dissolved solids. For a quick method of finding how concentrated, take a look at nomograph on page 206.



BAKER PERKINS

SIZE 14 JNM2 UNIVERSAL MIXER

**— uniformly blends special vinyl compounds
for Auburn Button Works, Inc., Auburn, N. Y.**

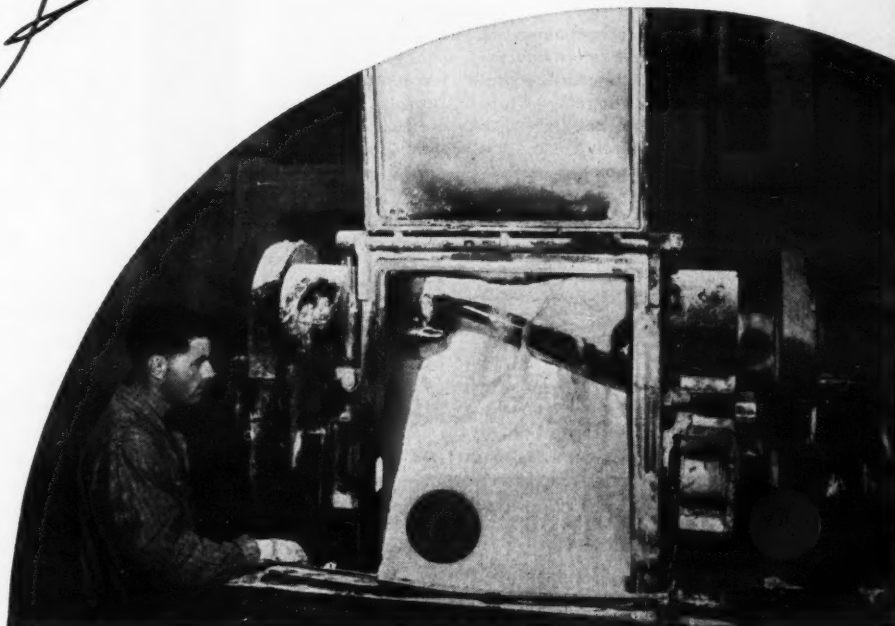
As an intermediate processor of raw materials for plastics fabricators, the Extrusion Division of Auburn Button Works in Auburn, New York, compounds and blends a wide variety of special vinyl plastic mixtures for its many customers. Thorough mixing and intensive kneading of the materials is necessary to insure a uniform blend with high tensile strength, good surface quality, retention of heat and light stability and other characteristics important in the finished extrusion. To obtain these characteristics, Auburn employs a specially designed Size 14 BAKER PERKINS JNM2 Universal Mixer with a working capacity of 50 gallons and a total capacity of 75 gallons. This machine is equipped with a trough shell of #304 stainless steel and is jacketed for 80 lbs. steam pressure. It has cast sigma blades with dispersion faces, cored for steam, and is driven by a 20 h.p., 900 rpm. motor.

BAKER PERKINS Universal Mixers are adaptable to virtually every mixing and kneading operation from very light to heavy duty, handling mixtures ranging in consistency from dry powders to stiff plastic masses. For complete information about Universal Mixers and other B-P equipment for the chemical processing industries, consult a BAKER PERKINS sales engineer or write us today.

289

BAKER PERKINS INC.

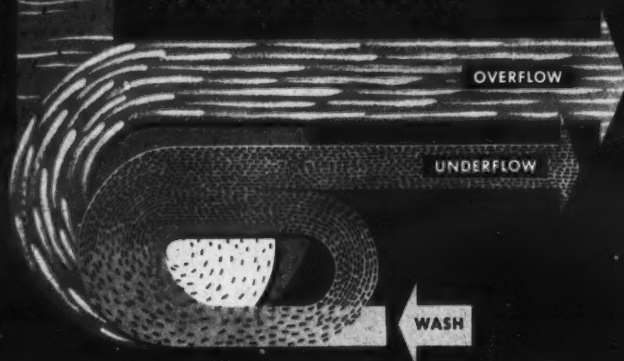
**CHEMICAL MACHINERY DIVISION
SAGINAW, MICHIGAN**



When inquiring check CP 3662 on handy form, pgs. 2-3 •

FEED

CONTINUOUS SEPARATION OF LIQUIDS AND SUSPENDED SOLIDS



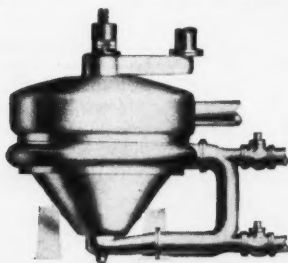
The Merco Separator brings the modern, continuous flowplan to new phases of the chemical industry. It replaces bulky, batch-type operations, eliminating inherent slowness, contamination and fluctuations.

Versatile Merco Separators are economical replacements for conventional settling tanks, filters and centrifuges. In addition, Mercos handle micro-classification and washing of extremely fine particles—functions that cannot be economically duplicated by other means.

Merco continuous separation is based on a unique return flow principle. Clarified liquids and concentrated solids are separated and discharged without clogging, buildups, surges or retention of material. The action is entirely enclosed. All controls are external and simple.



Write today for Descriptive Bulletin C411 and Application Data



MERCO CENTRIFUGAL CO.

AFFILIATE OF THE MERRILL COMPANY, ENGINEERS
150 GREEN STREET • SAN FRANCISCO • CALIFORNIA

When inquiring check CP 3663 on handy form, pgs. 2-3

PROCESSING

Flotation unit can remove light, heavy particles at same time . . .

those adhering to air bubbles rise, are skimmed off top

Uses: General flotation work in chemical, metallurgical, pulp and paper, and petroleum fields.

Features: Besides handling floatable particles, machine can be equipped with bottom scraper for removing settleable particles. Both types of particles are removed continuously.

Description: Prior to entering machine, influent is aerated under pressure in saturator tank to dissolve air in stream. Upon entering machine, dissolved air comes out of solution (because of pressure release) in form of tiny bubbles, size of which depend upon aeration pressure or pressure drop at release point and air in solution.

Particles adhere to bubbles and rise to top, where they dewater partly and are moved to collector trough for removal.

Concentration of "float" can be varied by changing holding time on surface before skimming. This is accomplished by adjusting the operating level to regulate quantity being skimmed off by rotary skimmer.

(Acroflator is product of Graver Water Conditioning Company, a division of Graver Tank and Manufacturing Company, Dept. CP, 216 West 14th St., New York 11, N. Y. Check CP 3664, pgs. 2 & 3.)

Wet-blast unit occupies 22 x 22" floor space

Compact wet-blast unit for metal finishing shop is described on one-page folder. Drawings and photograph illustrate design and operation.

Folder "Pressure Blast Jr." is issued by The Cro-Plate Co., Inc., Dept. CP, 747 Windsor St., Hartford 5, Conn. When inquiring specify CP 3665 on handy form, pages 2 and 3.

NEW



The Barnstead PRESSURE BANTAM DEMINERALIZER

delivers MINERAL-FREE WATER at point of use

Delivers demineralized water in continuous flow under pressure at from 5 to 25 gallons per hour. Connects to any water line. Like turning on a faucet. Minerals are chemically removed from water by ion-exchange. No heat or cooling water employed. Uses high capacity replaceable cartridge. Hundreds of uses in industry. Bulletin #128 describes most of them.

Write for Bulletin #128

Barnstead
STILL & STERILIZER CO.

66 Lanesville Terrace, Forest Hills, Boston 31, Mass.

When inquiring check CP 3666 on handy form, pgs. 2-3

Kleenslot THE PERFECT PREPARATION SCREEN GUARD



The screen guard is built into the screen and the guard bars permit only the finer particles to pass over the screen. All sizes and most materials furnished.



HERE'S HOW IT'S DONE

Cross section at left shows how KLEENSLOT Screens operate on a non-clogging principle.

Wedge Wire KLEENSLOT screen guards can be furnished in special sizes to your requirements in practically any type of long wearing metal. They are made to close tolerances like all Wedge Wire products—the width of each wire is held to plus or minus .002 to insure uniform opening width. All Wedge Wire features are embodied in these screen guards and it is to your advantage to consider them from the standpoint that they are non-clogging, non-blinding, strong, rigid, uniform and more economical in the long run.

SEND THIS COUPON TODAY!
DON'T DELAY

WEDGE WIRE CORP.
Gas St. at Nickel Plate R.R., Wellington, Ohio

Gentlemen:

Please send us literature outlining the superiority of Wedge Wire construction.

COMPANY _____

NAME _____

ADDRESS _____

Wedge-Wire CORPORATION

GAS ST. AT NICKEL PLATE R.R. • WELLINGTON, OHIO

When inquiring check CP 3667 on handy form, pgs. 2-3

CHEMICAL PROCESSING

**Peripheral velocities of mixers
range from 60 to 100 ft/sec**

Mixers capable of operating at peripheral velocities of 60 to more than 100 ft/sec are described in four-page folder. Speed occurs along outside of mixer's revolving rotor. Uniform mixing, with no stratification, is accomplished with little surface boil and vortex so that a minimum of air is mixed into the liquid.

Illustrated with photos, drawings, and tables, literature discusses theory of operation, design, and advantages. Units range in size from 1/3 to 30 hp.

"Hermas Jet Mixer" is issued by Hermas Machine Company, Dept. CP, PO Box 166, Hawthorne, New Jersey. When inquiring specify CP 3668 on the convenient Reader Service slip which is located between pages 2 and 3.

**Temperatures up to 1200°F possible
with rugged, large-equipment
heating mantles . . .**

can be used on 1 to 200-gallon capacity vessels

Uses: For heating kettles or vessels in pilot or production plants.

Features: Fabric used in mantle is break-resistant and will withstand heavy usage. Mantle can be used for temperatures up to about 1200°F (650°C).

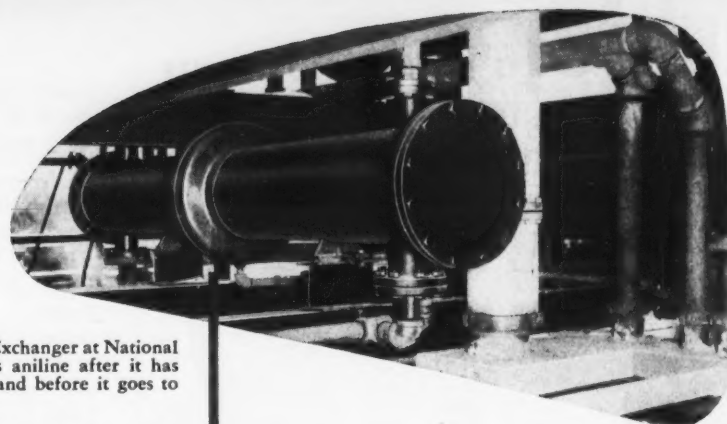
Description: Nichrome resistance wire is woven into fabric spirally from bottom up. Spacing between winds is small at bottom of mantle and increases toward equator of kettle or whatever receptacle is used. Consequently, area of greatest heat input is around bottom center, making set-up ideal for distillations, where highest boiling fractions remain to last and need extra heat.



Large-size heating mantles stand rough handling

Mantles are available for equipment with capacities from 1 to 200 gallons. Those for the larger units have multiple heating circuits from top to bottom.

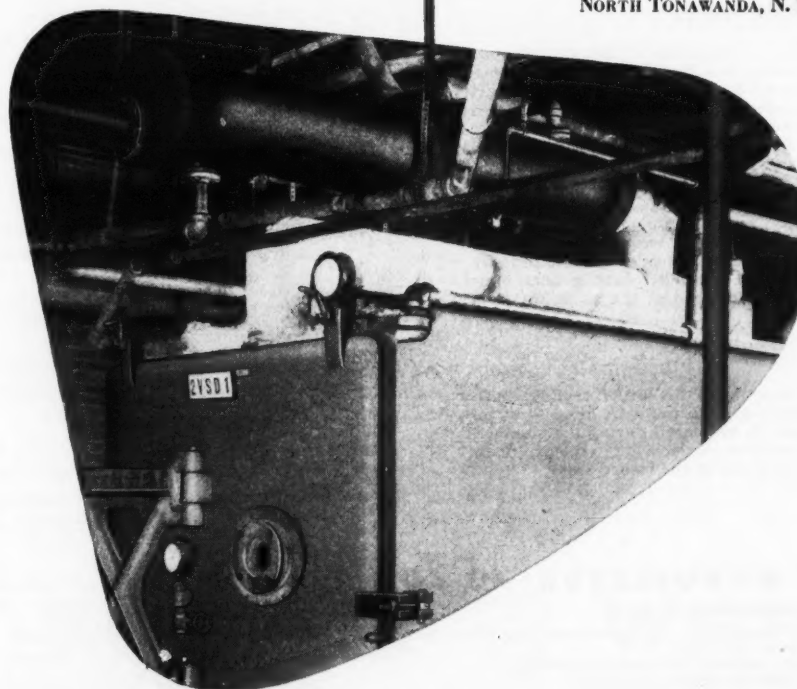
(Heating mantles are product of Glas-Col Apparatus Co., Inc., Dept. CP, 711 Hulman Street, Terre Haute, Indiana . . . or for more information check CP 3669 on handy form, pages 2 and 3.)



• ADSCO Heat Exchanger at National Aniline sub-cools aniline after it has been condensed and before it goes to storage.

WHERE A HEAT EXCHANGER MUST BE GOOD

• ADSCO Heat Exchanger (insulated) above vacuum drier at National Aniline condenses organic acid vapor in tubes with water or brine in shell. Exchanger equipped with shell expansion joint.



The ADSCO Heat Exchangers shown on this page are installed in the Buffalo, N. Y., plant of the National Aniline Division of Allied Chemical & Dye Corporation. The manufacturing processes of National Aniline require engineered equipment of the highest caliber. . . . ADSCO, in business since 1877, offers the chemical processing industry a complete line of carefully-engineered heat exchangers built to customers' specifications or to our recommended designs. Inquiries are cordially invited.

AMERICAN DISTRICT STEAM COMPANY, INC.

GENERAL OFFICES
NORTH TONAWANDA, NEW YORK
PLANTS
NORTH TONAWANDA, N. Y., AND RICHMOND, CALIF.



EXPANSION JOINTS



TRAPS



STRAINERS

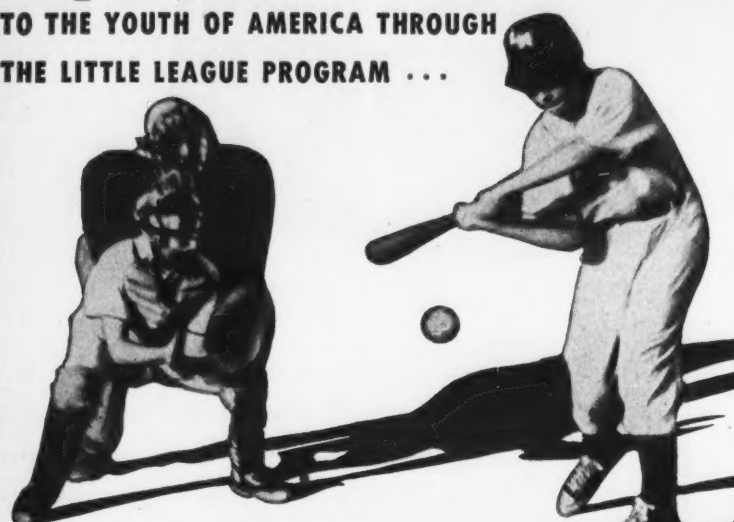


SEPARATORS

When inquiring check CP 3670 on handy form, pgs. 2-3

Sparkler

IS PROUD TO CONTRIBUTE
TO THE YOUTH OF AMERICA THROUGH
THE LITTLE LEAGUE PROGRAM . . .



Everybody Wins!



YOU WIN

All over America 3,500 Little League teams compete this year in a series of games, climaxing in a World Series in Williamsport, Pa. These youngsters, all between eight and twelve years old, quickly learn two traits that will help them keep our nation great in future years — competition and fair play. Training like this is insurance for you that the young men of tomorrow will want to live by those ideals you, as an American, cherish.

THE BOYS WIN

Being part of the team, the pride of wearing the uniform, making a good play — these are all things each Little Leaguer enjoys at the moment, and will remember for the rest of his life. Regardless of the score at the end of the game, the boys all come out winners.

SPARKLER WINS

Sparkler Manufacturing Co. sponsors this Little League team in Mundelein, Ill. Formed four years ago, there are fifteen boys on the team, and twenty games to be played during the summer. Sparkler wins in pride — pride of contributing to the happiness and growth of these Big Leaguers of the future.

SPARKLER MANUFACTURING CO.

MUNDELEIN, ILLINOIS

Canadian Factory, Galt, Ontario

European Factory, Amsterdam, Holland

For over a quarter of a century, engineers and manufacturers of a complete line of industrial filtration equipment.

When inquiring check CP 3671 on handy form, pgs. 2-3

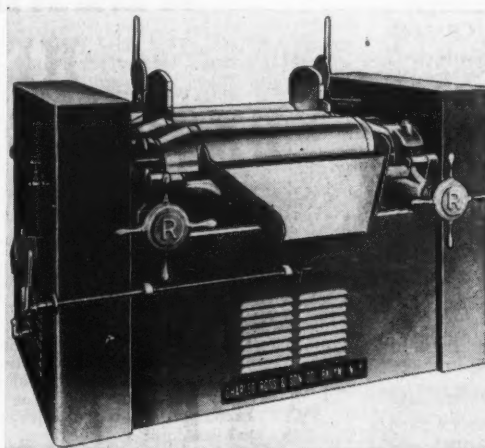
PROCESSING

Center roll operates in either fixed or floating position on 3-roll mill . . .

conversion to either setup made easily without special tools, kits

Uses: For mixing and grinding chemicals, cosmetics, paints, and printing inks.

Features: Mills can be operated with fixed center roll and four-point adjustment when differences in pressure between feed and takeoff rolls are desired, or with floating center roll and two-point adjustment when equalized pressures are preferred.



Three-roll mill has balanced apron, provides uniform pressure on front roll as knife wears

Conversion from one operation to other is easily accomplished without special tools or kits.

Description: Ross 52TC high-speed three-roll mills achieve high shear by their high differential speed ratio. Apron can be raised or lowered to most efficient takeoff position. Balanced apron provides constant uniform pressures of knife on front roll as knife wears.

Mills have manual adjustment of rolls, with ball thrust bearings on adjusting screws to facilitate turning of handwheels. Large calibrated indicating dials assure parallelism of roll faces with corresponding dial readings.

Machines are reported to give greater production and assure top operating efficiency when one mill must meet various requirements of different materials. Units are available in six sizes, from 4 1/2" x 10" to 16" x 40".

(52TC Three-roll mills are manufactured by Charles Ross and Son Company, Dept. CP, 148-156 Classon Avenue, Brooklyn 5, New York . . . or for more information reader may simply check CP 3672 on handy Reader Service slip which is located between pages two and three.)

SPRAY NOZZLES

for chemical spraying, cooling, humidifying, dehydrating, and hundreds of other applications.

You'll get the right nozzles quicker by calling Binks... manufacturers of one of the most complete selections ever produced.

A wide range of spray patterns, sizes, capacities...with nozzles cast or machined from standard or special corrosion-resistant metals.

MAIL COUPON NOW!

Binks Manufacturing Company
3120-37 Carroll Ave., Chicago 12, Ill.
O. K. Binks, send me your
Spray Nozzle Catalog...FREE!

NAME _____
COMPANY _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____

Binks
MANUFACTURING CO.

A COMPLETE LINE OF
INDUSTRIAL SPRAY NOZZLES
AND COOLING TOWERS

When inquiring check CP 3673
on handy form, pgs. 2-3

CHEMICAL PROCESSING

Theorizing about weighing problems when you should be THAYER-IZING them?

SAVE TIME AND MONEY IN BAGGING, BATCHING
AND CHECKWEIGHING WITH THAYER SCALES.

Why guess or gamble with improper scales. Use Thayer scales and enjoy outstanding accuracy, speed and convenience which assure quantity and quality control. Whether yours is a bagging, batching or checkweighing problem involving powder, pellets or dry mixes these important Thayer features can save you man-hours and increase your production:

- Shockproof leverage system — no wear-vulnerable knife-edge pivots.
- Automatic control and operation — you minimize "human factor" in weight determinations.
- Optional design features — capacities, controls, feeding systems, etc., easily designed to suit your needs.
- Precision construction — expert construction to proven design assures accuracy over long periods.

For more complete details on the Thayer Scale suited to your job, write outlining your problem.

Thayer Automatic Filling Scale Model 600G

For holding, filling and checkweighing bags of powdered materials to tolerances within 2 oz. Feeder handles both highly flooding materials and those which flood only at times. Utilizes both gravity flow (plus compressed air or vibration when needed) and positive "dribble" feed. When proper weight is reached, feed gates close and checkweight lights indicate end of filling cycle. If weight is O.K., light flashes and filled bag is dropped or held for push button release.

Handles up to 6 bags per minute of unit weights ranging from 25 to 200 pounds. Also available as a net-weigher. Write for Bulletin 600G.

Thayer Fully-Automatic Filling Scale Model 400N

New fully-automatic scale for weighing and discharging loads for bagging or batchweighing. Dry materials in granular or pellet form are readily handled by unique feeding system that closely controls amount and rate of feed of any free-flowing material without pre-aerating or separating. Once speed and weighing controls are set, operation is completely automatic.

Handles weight units from 25 to 200 pounds at speeds up to 10 units per minute. Stainless steel feeding system. Also available as gross-weigher. Write for Bulletin 400N.

Thayer Checkweight Scale Model 200R

Automatically indicates weight of filled bags, drums and cartons. Offweight packages are separated from those properly filled by having the motor-driven, two-way conveyor deposit them at opposite ends of scale. Over- and under-weight tolerances are independently adjustable over a wide range.

Dial shows how much each package is offweight and horn sounds as each improperly filled package is discharged. Optional signal lights, remote dials, etc. available.

Model 200R handles up to 20 packages a minute with unit weights from 20 to 200 pounds. Write for Bulletin 200R.

Thayer Checkweight Scale Model 200S

This Thayer scale has same performance specifications as Model 200R but has the conveyor platform belt only 10" above the floor. With the conveyor located beneath the scale, the spillage from broken bags will fall to the floor and not affect the weight of the bags which follow.

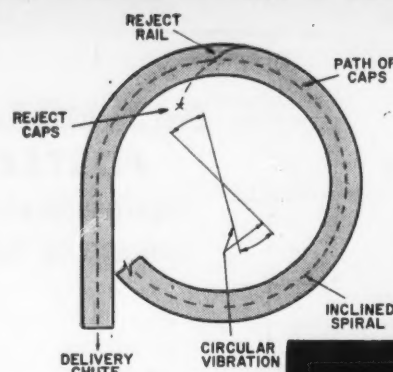
Like the Model 200R, this scale may be equipped with additional dial indicators for installation at remote control stations, colored lights which show whether the package on the conveyor is over- or under-weight, or a printing recorder which records the exact weight of each package. Write for Bulletin 200S.



THAYER SCALE AND ENGINEERING CORPORATION
492 EAST WATER STREET, ROCKLAND, MASS.

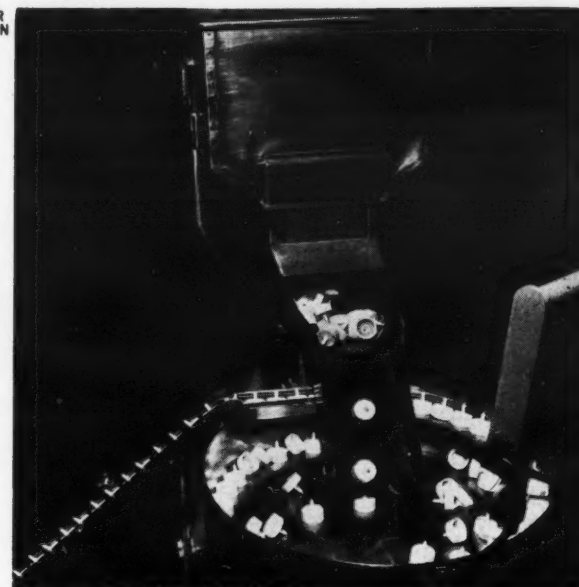
Where weight is worth money ... it pays to be sure!

When inquiring check CP 3676 on handy form, pgs. 2-3



packaging

Caps are fed at predetermined rate to sorting unit. Vibrating motion sends caps up inclined plane. Only upright caps can get past guide rail



New shaker caps
now come out
"right side up"

special caps meant hand operation until vibrating sorter was installed

H. J. OGLESBE, Manager
Finishing Department
Abbott Laboratories
with R. J. CALLAHAN, Assistant Editor

on interior surface of the sorter allows upright caps to pass. It returns caps which lie on their side to bottom of the bowl for realignment.

At first, sorter was fed by hand. This proved unsatisfactory because hand loading tended

Problem: Abbott Laboratories' Sucaryl (cyclohexane-sulfamic acid) is a synthetic sweetening agent which can be heated or cooked without decomposition. To make the material more convenient to use, a shaker bottle was introduced. Projecting nibs on the irregular cap clogged conventional capping equipment, however. This made it necessary to hand-cap bottles.

Solution: An electric vibrating spiral sorter was installed in the line. Circular vibrating motion of the unit sends caps up spiral leading to a chute. A guide rail



Projecting nibs of caps jammed regular capping equipment

to choke sorting operation. A vibrating feeder was installed. Working at a predetermined rate, it keeps pace with sorter capacity and capping production requirements.

Results: Abbott improved the work performance of each operator two and a half times. In the nine months method has been used there has been no trouble with any of the equipment.

(Syntron vibrating sorter is manufactured by The Syntron Co., Dept. CP, 110 Lexington Ave., Homer City, Pa. . . or for more information check CP 3677 on handy form, pages 2 & 3.)

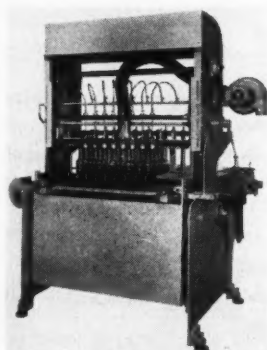
(Vibrating Feeder is manufactured by Traylor Div., Jeffrey Mfg. Co., Dept. CP, 956 N. Fourth St., Columbus 16, Ohio. Check CP 3677A on handy form, pages 2 and 3.)

Air cleaning machine saves space by unscrambling containers in same operation . . .

speeds up to 150 per minute on round, oval, or rectangular containers obtained

Uses: Air cleaning and unscrambling of most standard containers up to gallon capacity.

Features: Compact unit requires about one-third the space that a separate cleaner and unscrambler would. Variable speeds from 30 to 50 per minute on round, oval, or rectangular containers can be obtained. Unit is silent and has a gentle action with no marring or scratching.



Cleaner has gentle action, will not mar or scratch containers

Description: Combination air cleaner and straight-line unscrambler, called the Feedomatic Air-Cleaner, thoroughly cleans each container before it is single-filed into conveyor. High-pressure air and suction remove dust, lint, and other

foreign matter quickly and effectively.

(Container cleaning machine is a product of Biner-Ellison Machinery Co., Dept. CP, 1101 N. Main St., Los Angeles 12, Calif. . . or for more information check CP 3678 on handy form which is located between pages 2 and 3.)

**FIBRE DRUMS?
STEEL SHIPPING CONTAINERS?
STEEL EQUIPMENT CONTAINERS?**

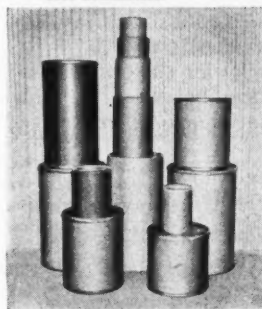
RHEEM Announces a Complete Line of Fibre Drums to Provide an All-Inclusive Shipping Container Service

To supplement its line of steel shipping and custom equipment containers, Rheem has added a complete line of Fibre and Fibre-Metal drums. These strong, light weight, inexpensive drums come in four types and in a wide variety of sizes.

Choose the Drum that Fits Your Needs



Choose the type that best fits your needs — All-Fibre drums, or Fibre-Metal drums with steel bottoms with either slip or friction covers or with the new, easy to install and remove Rheem-Lox ring. Only Rheem offers all these types of low cost containers.



Choose the Size that Fits Your Needs

Choose the size that best fits your needs. Fibre drums from 1- to 32-gallons in capacity; Fibre-Metal drums from 5- to 60-gallons. There is virtually a size for every possible requirement.

**RHEEM
MANUFACTURING COMPANY**

Chicago 29, Illinois New Orleans 20, La. Seattle, Washington
Houston 20, Texas New York 22, New York South Gate, California
Linden, New Jersey Richmond 4, California Sparrows Point 19, Md.
Export Sales, 477 Madison Avenue, New York 22, New York

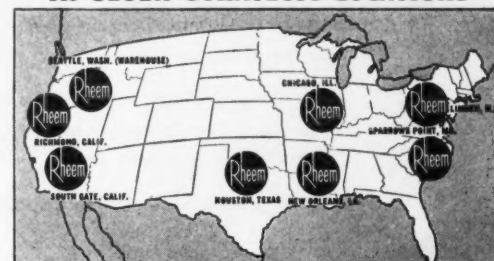
Foreign Affiliates and Associates: Argentina—Buenos Aires • Australia—Adelaide, Brisbane, Fremantle, Melbourne and Sydney • Brazil—Rio de Janeiro • Canada—Hamilton • Italy—Milan • Peru—Lima • Philippine Islands—Manila • Singapore • Spain—Madrid • United Kingdom—Bristol.

NOW, More than ever before, You Can Rely On for all your shipping container requirements



**GET THEM ALL...
GET THEM FAST...
from
RHEEM**

RHEEM STEEL CONTAINERS ARE MADE IN SEVEN STRATEGIC LOCATIONS



Rheem Fibre Drums are being manufactured in four of these plants. Production lines are scheduled for installation in other plants soon.



"FAMILY" IDENTIFICATION

Rheem can furnish on Fibre drums the same type of decorative service it provides users of Rheemcote lithographed steel drums. Any design or trade mark can be reproduced on an all-over label for Fibre drums in any number of colors to provide "family" identification for your products.

30 gal. Rheem Fibre-Metal Drum

55 gal. Rheemcote Steel Drum

MAIL COUPON NOW!

RHEEM MANUFACTURING COMPANY
(Mail to Nearest Sales Office, Listed at Left)

☐ We would like to have your packaging engineers come to our plant and study our shipping container problems.
☐ Please send additional information.

NAME OF COMPANY _____

STREET _____

CITY _____ ZONE _____ STATE _____

BY _____

When inquiring check CP 3679 on handy form, pgs. 2-3

ALVEY BOOM CONVEYOR

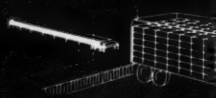


You can cut down "manhandling" of Packages at loading docks — reduce tie-ups of trucks and trailers for both incoming and outgoing merchandise.

Motor driven mechanism is reversible so the powered belt operates in either direction. Push button controls permit exact control by the operator.

An Alvey Engineer will be glad to discuss these power driven booms — or any conveyor problem with your technical staff.

Please write for an appointment.

| LOADING | UNLOADING | STORED |
|--|--|---|
|  |  |  |
| Boom extends into truck and withdraws as required — always unloading at a convenient location. | When truck backs to dock, conveyor extends as far into truck as required to unload easily. | When not in use, boom is withdrawn to clear dock aisle. |

Every time you MANhandle a package, you add to the cost and nothing to the value; therefore, put your packages on Alvey Conveyors that are engineered to fit your individual requirements.

ALVEY

ALVEY CONVEYOR MANUFACTURING COMPANY

9308 Olive Street Road, St. Louis 24, Missouri

BRANCH OFFICES IN PRINCIPAL CITIES

When inquiring check CP 3680 on handy form, pgs. 2-3

PACKAGING

Shipping acid in fiber drums made practical by liner of polyester plastic . . .

moisture-resistant, chemically inert surface is created by lamination

Uses: Lining fiber drums for shipment of corrosive chemicals that would ordinarily cause drum to deteriorate.

Features: By laminating polyester film to inside of fiber drum, a moisture-resistant, chemically inert surface is created.

Description: Mylar polyester film is made from polyethylene terephthalate — the polymer formed by condensation reaction between ethylene glycol and terephthalic acid. It remains flexible and stable over a range of temperatures from —60 to 150°C, thus assuring good resistance.

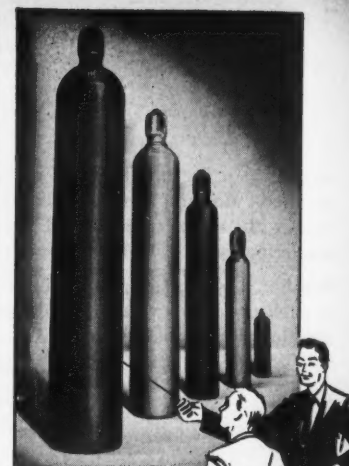


Inner surface of drum is corrosion resistant, due to coating of polyester plastic

The following chart points out the strength of the film after immersion in acids and solvents for different periods of time:

| | Days Immersed (@ room temp) | Residual Tensile Strength (1 mil film) (psi) | Residual Tear Strength (1 mil film) (gm) |
|------------------------------------|-----------------------------|--|--|
| (control) | | 24,000 | 30 |
| CH ₃ COOH | 33 | 18,000 | 25 |
| Conc. HCl | 5 | 18,000 | 20 |
| 35% HNO ₃ | 7 | 16,900 | 6 |
| 20% H ₂ SO ₄ | 7 | 23,500 | 8 |
| 12% NH ₄ OH | 9 | 14,200 | 9 |
| 10% NaOH | 33 | 20,000 | 10 |
| Acetone | 33 | 15,000 | 20 |
| C ₂ HCl ₃ | 33 | 15,800 | 22 |
| Xylene | 33 | 21,700 | 20 |

(Mylar polyester film is a product of Film Department, E. I. duPont deNemours & Company, Dept. CP, Nemours Building, Wilmington 98, Delaware. . . or for more information about manufacturer's product reader may simply check CP 3681 on the convenient Reader Service slip which is located between pages two and three.)



behind a
QUALITY
product—

... a
QUALIFIED
technical service

Depend on *Harrisburg Steel* for quality seamless steel cylinders for high-pressure gases . . . hundreds of companies, large and small, have done that for generations!

And don't forget: when you have a *technical problem* involving cylinders, or need a special type of cylinder, put it up to *Harrisburg Steel's* expert engineering staff.

Address our Sales Engineer . . . or write today for Catalog and prices.

HSC-CC-2/54

101 YEARS IN  PENNSYLVANIA'S CAPITAL
Harrisburg Steel
CORPORATION
HARRISBURG 24, PENNSYLVANIA

When inquiring check CP 3682 on handy form, pgs. 2-3

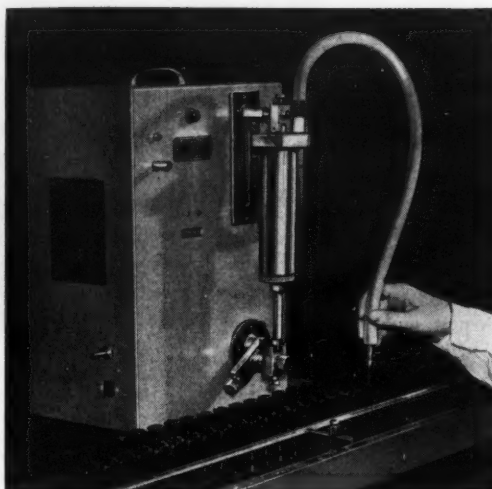
CHEMICAL PROCESSING

Teflon piston rings aid operation of vial filling unit . . .

finds use in laboratory as automatic pipet

Uses: In pharmaceutical or cosmetic applications where vials, ampules, and small containers up to 4½ oz in size are filled with any free-flowing liquid, including saturated solutions and suspensions. Unit also finds use in the laboratory as an automatic pipet for dispensing culture media, chemical and serological reagents, and the like.

Features: Filling machine is available with stainless steel filling units equipped with adjustable Teflon piston rings. Wiping action of Teflon rings prevents any accumulation of solids on cylinder walls and enables filling unit to handle any free-flowing liquid.



Volume of fill is accurate to fraction of 1%

Description: Filamatic aseptic vial fillers are easy to use. Setup time is only a few minutes. Stainless steel filling units can be used with all existing models of filling machine. Two kinds of filling unit are available, FU-15 and FU-130. Former has a capacity of 1 to 15cc per stroke; latter from 10 to 15cc per stroke. Delivery volume is varied by means of a graduated micrometer adjustment in measured stages of .001". Volume of fill is controlled to fraction of 1%.

Accessories for unit include an automatic electric counter, foot switch and synchronizer. Synchronizer enables any number of Filamatics to be operated in tandem for multiple nozzle filling.

(Filamatic aseptic vial fillers with stainless steel filling units are a product of National Instrument Co., Dept. CP, 5005 Queensbury Ave., Baltimore 15, Md. . . . or for more information check CP 3683 on the convenient Reader Service slip which is located between pages 2 and 3.)

*Our pioneering
pays off in
profits for you*

BAGPAK

MULTIWALLS

It's the Crease that does it!

- Makes bagtop forming easier
- Speeds Bag closing
- Insures better filling
- Produces a better-looking package

Bagpak, the first to introduce multiwall bags to many industries, then improved them with the PREFORM top for easier, time-saving uniform closing. Now the PREFORM feature at the bottom means easier opening for faster, more complete filling.

You profit because your bags are filled, formed and closed in record time. You package bigger tonnage daily—and there's no waste.

Asking for complete information and prices places you under no obligation. Just write today to: Dept. P-19 Bagpak Division, 220 East 42nd Street, New York 17.

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BAGPAK DIVISION

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When inquiring check CP 3684 on handy form, pgs. 2-3

*These tough twins
protect your
hard-to-pack
products!*



Bemis Waterproof LAMINATED-TEXTILE Bags

These are the bags you need for the greatest protection at economical costs . . . *the strongest shipping bags made*. They are 3- or 5-layer construction, with crinkled paper or plastic linings laminated to cotton or burlap.

Bemis Flexibly Bags

If you require a little less than the super-protection of Bemis Waterproof Bags, these laminated, all-crinkled-paper bags are your best bet. Bemis Flexibly Bags are tough—all plies are crinkled to give stretch and flexibility.

Ask your Bemis Man to help you determine which is the practical, economical shipping bag for you. Remember—with either Bemis Waterproof or Bemis Flexibly, you get the benefits of Bemis crisp, bright multi-color printing . . . and Bemis multi-plant service.

Bemis



408 Pine St., Box 92
St. Louis 2, Mo.

When inquiring check CP 3685 on handy form, pgs. 2-3

PACKAGING

Covers stencil marks on boxes, cartons, or drums . . .

labels also erased by tan-colored product which is easily sprayed on

Tan-colored material, which is packaged in a spray can, is used to cover marking errors on new containers or as a means of reusing old containers. It may be used on crates, boxes, cartons, drums, or other containers. This stencil covering, called Stencil-Kover, dries rapidly permitting new stenciling or marking within ninety seconds. It is supplied in 12 oz cans.

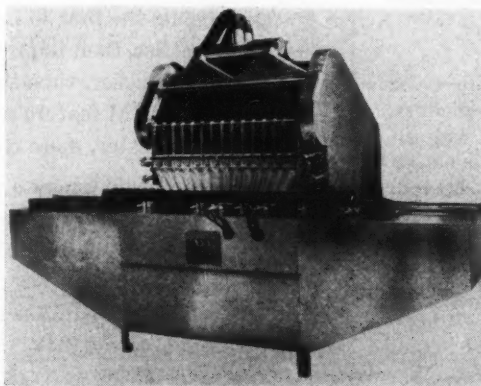
(Stencil covering is a product of Reynolds Ink, Incorporated, Dept. CP, 4500 Euclid Ave., Cleveland 3, Ohio . . . or for more information check CP 3686 on handy form, pages 2 and 3.)

**Fills tablets and capsules
at speeds to 150 a min
at 100 count/bottle . . .**

two rows of bottles are fed through machine; "flipper gate" permits handling of both

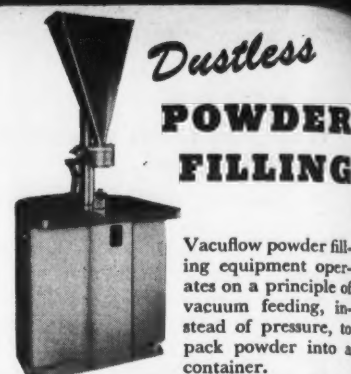
Uses: High speed filling of gelatin capsules, coated or uncoated tablets.

Features: Unit has a capacity of 100 to 150 bottles a minute of 100 count per bottle. Production is determined by size of pill and count per bottle. For example, on a large size soft shell gelatin capsule, machine can fill 100 bottles a minute of 100 count per bottle. On a coated or uncoated tablet of aspirin size, it fills 150 bottles a minute of 100 count per bottle.



Dust collecting attachment on tablet filler is optional

Machine is equipped with a double manifold filling two rows of bottles during each filling cycle. Operator places two rows of bottles under manifold, then starts machine. First, front row of bottles is filled with tablets and then by use of an air cylinder which operates "flipper gate", flow of pills is di-



**Dustless
POWDER
FILLING**

Vacuflow powder filling equipment operates on a principle of vacuum feeding, instead of pressure, to pack powder into a container.

VACUFLOW



Air is removed from the container to create a vacuum which draws a measured quantity of powder from the hopper. There is no problem with dust control, since the unique Vacuflow method simply does not involve air currents that cause dust.

Semi-automatic models are available for filling containers ranging from the tiny talcum box up to and including 100 lb. paper bags and 200 lb. drums. Rotary models are available for automatic production of 5 lb. sizes or less at speeds of 45 to 300 per minute.

Pneumatic is the one manufacturer in a position to furnish machines for making up complete production lines. Units are available for air cleaning, powder and liquid filling, capping and labeling a wide range of bottles, cans or jars.

PNEUMATIC SCALE CORP., LTD.
67 Newport Ave., Quincy 71, Mass.
Also: New York; Chicago; Dallas; San Francisco; Los Angeles; Seattle; Leeds, England
Canadian Division:
Delamere & Williams Company, Ltd., Toronto



When inquiring check CP 3687
on handy form, pgs. 2-3

CHEMICAL PROCESSING

rected to other row of bottles. Machine automatically stops when second row is filled so that operator can shift bottles.

Description: Fully-automatic tablet filling machine will handle bottles ranging in size from $\frac{1}{2}$ to $2\frac{1}{4}$ inches in diameter. Optional dust collecting attachment is to keep slats free from dust accumulation where coated tablets are being filled. Filling bars or slats can be arranged for any count. Change-over time from one size tablet or container to another is rapid.

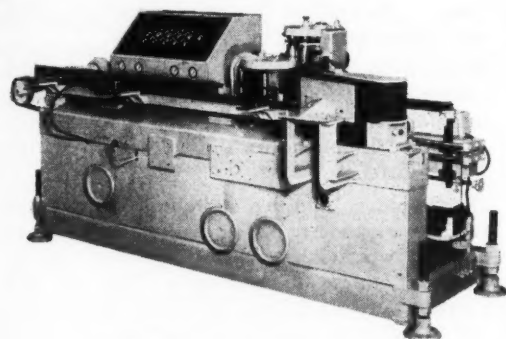
(Tablet filling machine is a product of Merrill Machinery Sales Co., Dept. CP, 111 W. Jackson Blvd., Chicago 4, Ill. . . or for more information check CP 3688 on handy form, pages 2 and 3.)

Labels never supplied by unit unless incoming container signals approach . . .

labeler will handle output of any bottling line

Uses: Automatic placing of labels on bottles of standard or unusual design.

Features: Unit offers push-button simplicity, integrating labels with containers, so that labels are never fed unless incoming containers signal their approach.



Labeler handles bottles at rates to 300/min

Description: Constant-motion labeler, called Aire-Xpress, uses no cams or reciprocating motions. Principle of vacuum label-handling assures precision label placement. Rotary motion of unit exerts full force over entire surface of label for positive adhesion.

Labeler will handle up to 300 bottles per minute, thus providing speed enough to handle flow from more than one filling and capping line, if necessary.

(Labeling machine is product of New Jersey Machine Corp., Dept. CP, 1580 Willow Ave., Hoboken, N. J. . . or for more information check CP 3689 on handy form, pages 2 and 3.)

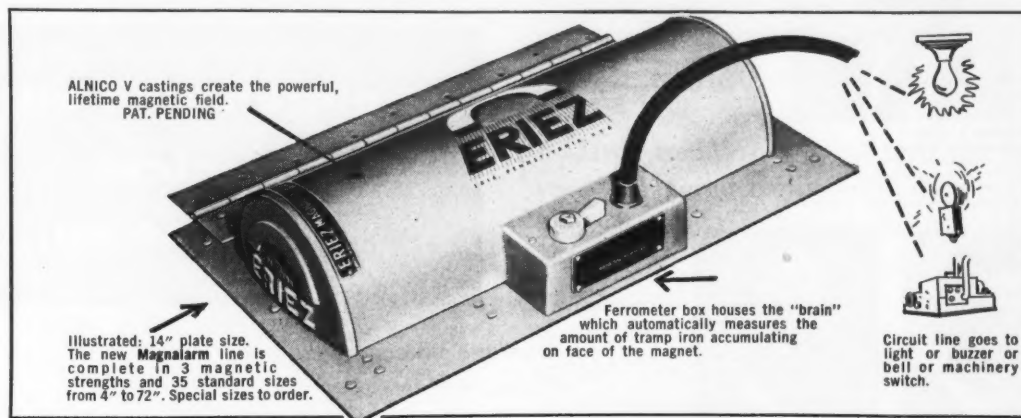
The only magnetic separator that tells you when your magnet needs cleaning:

it's the new **MAGNALARM**

Magnalarm, the revolutionary Eriez invention with a ferrometer "brain", signals you *automatically* when the magnetic separator has collected a preset amount of tramp iron! Maximum efficiency is the result! Tramp iron that used to "get by" due to overloaded and uncleaned separators is ended with a *Magnalarm*. Such

"extra" tramp iron could cause "extra" machinery damage, fires, product contamination.

Now *Magnalarm* signals you when the magnet plate needs cleaning. A light goes on . . . or a bell sounds . . . or the machinery line is shut down automatically. You are *always* guarded against costly tramp iron dangers with *Magnalarm*.



HOW DOES IT WORK?

Magnalarm's "brain" is a ferrometer which measures the actual magnetic loading. When the amount of tramp iron across the entire face of the magnet reaches the predetermined Danger Point (which is where magnetic effectiveness is temporarily reduced to minimum operating efficiency), the "brain" acts! A circuit is opened or closed depending on the action you require. Open circuits are used to ring a bell or buzzer or turn on a light. Closed circuits are used to shut down your line of machinery. The signaling action continues until the *Magnalarm* has been cleaned of its dangerous tramp iron load. The only electric current required is that used to open or close the circuit. *Magnalarm* is in itself the same powerful, non-electric, permanent magnetic separator which won Eriez the position of being the world's largest manufacturer of permanent magnets!

MAGNALARM "SAVINGS"

1. Trouble-saver by giving you the maximum protection against fires, machinery damage and product contamination.
2. Time-saver in eliminating the need of checking separators in remote and hard-to-get-to places.
3. Money-saver in eliminating the need of shutting down machinery while separators are checked.
4. Reputation-saver by guarding quality . . . telling you when and how much contamination you are getting in your line.

CARBORUNDUM COMPANY FINDS MAGNALARM THE ANSWER TO DIFFICULT PROBLEM

Carborundum Company of Niagara Falls, N. Y. had a serious problem with tramp iron which was causing heavy machinery damage to a rice coal pulverizer. Because an installation of magnetic separators would necessarily have to be in a place difficult and awkward to inspect, the maintenance of an ordinary magnetic separator created its own special problem. Accumulations of tramp iron on the magnet could readily become excessive even with periodic inspections and the cost of damage caused by tramp iron which

"might get by" would result in labor and replacement parts expense.

However, Carborundum Company found the new Eriez *Magnalarm* the perfect answer to its trouble. Inspection and cleaning of the magnetic separator is only necessary now when *Magnalarm* signals that a predetermined amount of tramp iron has been caught. So important to the company's equipment is the *Magnalarm* that Carborundum employs the signaling device which automatically shuts down the line the instant the alarm is tripped.

COST, INSTALLATION AND MAINTENANCE

The cost of *Magnalarm* is only pennies more than regular magnetic separators. Installation is simple. Easy-to-follow instructions come with each unit. *Magnalarm's* are preset at the Eriez factory but you can increase or decrease your *Magnalarm's* sensitivity by a simple adjustment.

MAGNETIC EFFICIENCY AS GOVERNED BY TRAMP IRON ACCUMULATION



"*Magnalarm's*" signaling action makes sure you operate only in the strong, safe range marked "A." Strength of ordinary magnets will be lowered by tramp iron accumulation to the inefficient operating danger area marked "B" unless checked and cleaned frequently.

WRITE FOR EXCITING, FULL DETAILS

on *Magnalarm*, the *only* magnetic separator of its kind! Fill out the easy coupon below. Do it yourself . . . or do it for someone within your organization who will be grateful for the complete "*Magnalarm*" story. Sizes. Magnetic strengths. Types of installation. Construction. Electrical circuits. Types of ferrometer element. Special features. Even how to order. It's all there.

ERIEZ

Eriez Manufacturing Company
731 Magnet Drive, Erie, Pa.



Send me the "*MAGNALARM*" literature:

Name _____
Address _____
City _____ State _____
Company _____ Title _____

When inquiring check CP 3690 on handy form, pgs. 2-3



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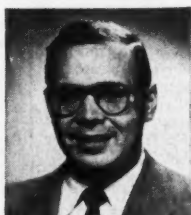
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PACKAGING

Fills plastic squeeze bottles automatically—at rates to 60 per minute ...

manual model handles up to 30 containers/min

Uses: Filling polyethylene squeeze bottles with any liquid or semi-solid.

Features: Fully-automatic filling machine, with conveyor, handles 40 to 60 containers per minute; manual model will fill from 15 to 30 per minute.

Description: Inexpensive filling unit, called the Simplex, comes equipped with cone or "U" shaped hoppers, or intake can have direct flow-line connection. Machine also handles 2, 4, or 8-oz glass jars as well as plastic bottles.

(Filling machine is a product of F. L. Burt Co., Dept. CP, 571 7th St., San Francisco, Calif. ... or for more information reader may simply check CP 3691 on the convenient Reader Service slip which is located between pages 2 and 3.)

Shaker on built-in scale assures tight fill of valve bags ...

pre-weighing is eliminated and minimum-size bag can be used, lowering costs

Uses: Packing of powdered, granular, pellet, and fibrous materials in valve bags.

Features: Scale on unit includes shaker which assures tightly filled valve bags, each containing uniform weight of materials being packed. Design of packer also eliminates any need for pre-weighing of materials.

Description: On this multiple-action model of the Auger-matic bag packer, built-in scale includes a shaker which jolts each bag vigorously and repeatedly during filling process. This not only prevents any slack-filled bags, but also permits

use of minimum size valve bags, thus lowering bag costs. When bag is shipped it arrives at destination just as full as when packed.

Unit also has a security clamp which holds bag in place on filling spout regardless of force with which material flows from spout. Operator releases bag when packer shuts



Snug fitting spout on packer minimizes dust

off by raising security clamp handle.

Snug fitting spout minimizes dust hazards from even finest powder, prevents waste of materials, and keeps bags clean with brand name and other printing free of dust. Packer can be mounted on casters for easy movement from one filling point to another in plant.

(Valve bag packer is a product of E. D. Coddington Mfg. Co., Dept. CP, 4036 N. 37th St., Milwaukee 9, Wis. . . or for more information check CP 3692 on handy form, pages 2 and 3.)

High-quality corrugated board from farmer's straw

How a high-quality corrugated board, with excellent crush resistance and runability, was developed using wheat straw as the fibrous medium, is told in eight-page bulletin. Color photos illustrate modern machines and controls used in the manufacturing process.

Bulletin on Cor-U-Cel is available from Alton Box Board Co., Dept. CP, Alton, Ill. When inquiring specify CP 3693 on handy form, pages 2 and 3.

Accuracy and ease of take-down featured on filling machine for chemical powders . . .

handles jars, cans, cannisters, bottles, shakers, or cartons at rates to 60/min

Uses: Automatic net-weight filling of pharmaceutical and drug powders — coarse to very fine consistencies. Containers filled may be cans, cannisters, bottles, jars, shakers, or cartons.

Features: Close filling tolerances are possible, with many cases of plus or minus in milligrams.

Normal accuracy factor is 1/16 oz to perfect. Output can be timed exactly with same speed on 1/2 oz as on 4 oz. Size changes require fifteen minutes or less, with no added parts. Entire unit is simply constructed, easy to take down for cleaning.

Description: Automatic filling machine, Model A-1 Pak King, has normal capacity from 1/8 to 8 oz with one-half speeds on one pound volumes. It is rated at 25 to 60 containers/min — double or triple this rate, containers permitting.

Unit is available with multiple filling heads or combination rotors to handle coarse as well as fine powders. Aluminum contact surfaces are optional.

(Filling machine is a product of Weigh Right Automatic Scale Co., Dept. CP, Mills Road, Box 896, Joliet, Ill. . . or for more information check CP 3694 on handy form, pages 2 and 3.)

Continental's formula for drumming up business: SERVICE



A great new fibre drum plant in Pittsburg, California gives Continental a cross-country coverage unmatched by any other supplier.

Continental's other plants are at:

Tonawanda, New York
Reading, Pennsylvania
Van Wert, Ohio
St. Louis, Missouri

From the wide variety of Continental fibre drums, you choose the size and style Tailor-Made for your product. Three bump-resistant, sure-locking, easy-opening styles: Leverpak, Stapak, Fiberpak. Your choice of many sizes, 17 different colors, 14 different inks. Special protective linings available for all of them.

You get more than lightweight, sturdy packaging when you buy Continental fibre drums. You get the *service* of Continental's nation-wide fibre drum division.

That means you have at your command Continental's experienced packaging engineers in twelve cities scattered all over the country. You have the use of Continental's research facilities. We will help you to test your packaging methods, to improve your old system or to establish a new and better system. We will help you to crack tough packaging "nuts". And don't forget Continental's quick deliveries to any point in the United States from our five fibre drum plants.

Call on Continental for packaging advice and efficient service!



CONTINENTAL © CAN COMPANY

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TAILOR-MADE
PACKAGE SERVICE

When inquiring check CP 3695 on handy form, pgs. 2-3

BIDDLE *Instrument News*

MOTOR and PHASE ROTATION TESTER

A Dual Purpose Instrument

For determining:

- ... Direction of rotation of electric motors before they are connected to the line.
- ... The phase rotation or sequence of energized power circuits.

Here is a positive means for determining which motor leads must be connected to certain conductors of a supply system to insure that the motor will rotate in a prescribed direction when energized.

Write for BULLETIN 80-CP



FAMOUS Dr. HORN HAND TACHOMETER

Many consider Dr. Horn to be the finest speed measuring device obtainable. Gives instantaneous readings of rotational—or linear and peripheral speeds—regardless of the direction of rotation. Measures 6 ranges from 25 rpm to 30,000 rpm. Operates with equal precision in vertical, horizontal or slanting position. Simple mechanism. Over-speed protection. Low maintenance. Long life. James G. Biddle Co. is sole U.S. distributor.

Write for BULLETIN 35-65-CP

TWO-IN-ONE JAGABI® TACHOSCOPE

Combines speed indicator and stop watch. Replaces "human element" of error in starting and stopping with higher accuracy of calculation because Tachoscope can be operated for longer period. High precision instrument for measuring machine speeds up to 20,000 rpm. Frequently used as a standard for checking other speed measuring instruments.

The high quality stop watch may also be used independently.

SPEED MEASURING BULLETIN. A selection chart of Speed Measuring Instruments for specific conditions is a feature of BULLETIN 35-CP



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1316 ARCH STREET, PHILADELPHIA 7, PA.

James G. Biddle Co.
1316 Arch St., Phila. 7, Pa.

Gentlemen:

Please send me material checked:

☐ 80-CP ☐ 35-65-CP ☐ 35-CP

NAME _____

JOB FUNCTION _____

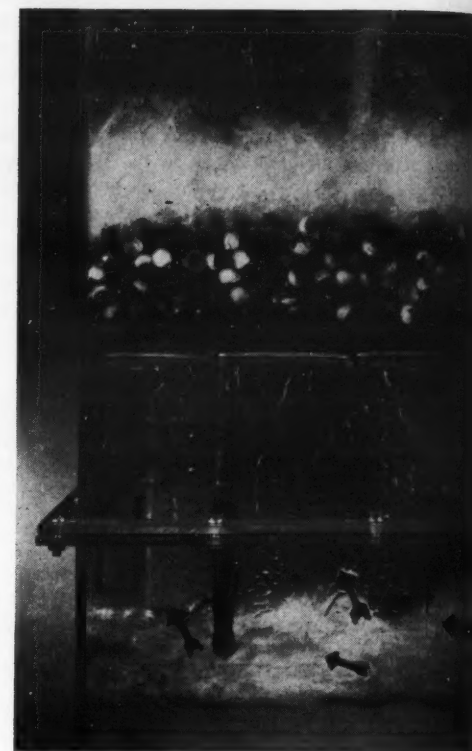
COMPANY _____

ADDRESS _____

When inquiring check CP 3696 on handy form, pgs. 2-3

engineering and maintenance

As shown in this plastic model,
dust-laden air rushes up through
marble bed and water bath
of unit which —



collects dust three ways

Air-water balance adjusts itself
to maintain high efficiency
over wide range of air flow

Uses: Wherever wet-type dust collector is applicable.

Features: Unit separates dust from air in three ways: impingement on wetted surface of glass spheres; impingement on bubble surfaces; and entrapment by contact with water droplets. About 85% of dust is separated by impingement.

Design of filter automatically compensates for variations in volume and velocity of air flow. High efficiency is maintained throughout wide range. Air-water balance gives near-uniform separating action within bed of glass spheres. Pressure drop remains constant at about 4" WC.

Here are some typical separating efficien-

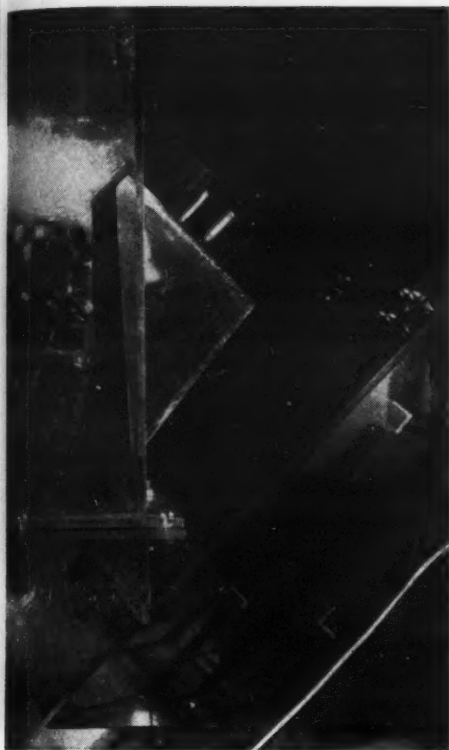
cies characteristic of various dusts:

| | |
|------------------------------|-------|
| Western Bentonite (200 mesh) | 99.7% |
| Carbonyl Iron (3-4 microns) | 97.5% |
| Optical Dust | 99 % |

In some cases where extremely fine dusts are involved, it might be desirable to use two units in series. First collector might remove 80-90% of dust, and second an additional amount, for a total removal of 95% or more.

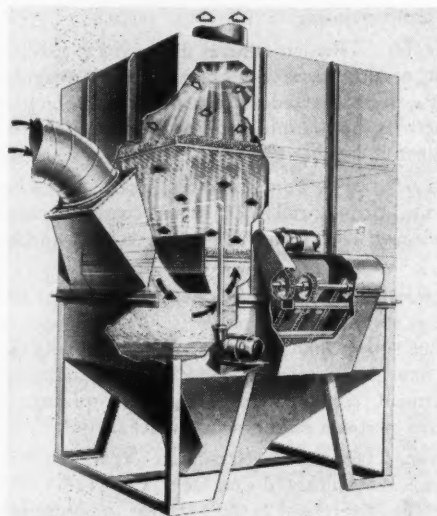
Description: In this collector, called the Hydro-Filter, dust-laden air is drawn upward through glass-sphere filter bed which is flooded with water. Spheres are about 3/8" in diameter. Air stream is finely divided as it passes among wetted spheres, and forces its way through water which is constantly descending through filter bed. Bubbles are formed on surface of water bath by air-water contact.

Above filter bed a turbulent layer of water



droplets and air is maintained. This moist, turbulent air traps those dust particles not separated by impingement on wetted spheres or on bubble surfaces. Depth of turbulent layer is determined by height of overflow weir. Water passing into

(Continued on next page)



Dust-laden air enters unit at left and is drawn up through filter beds and water. Clean air leaves at top

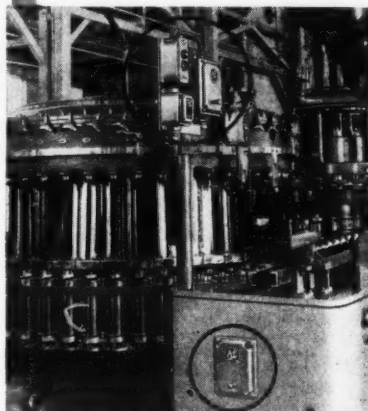
Allen-Bradley Trouble Free Starters for the Chemical and Process Industries

Wherever you find outstanding industrial equipment, you will discover reliable Allen-Bradley motor control. There is a reason!

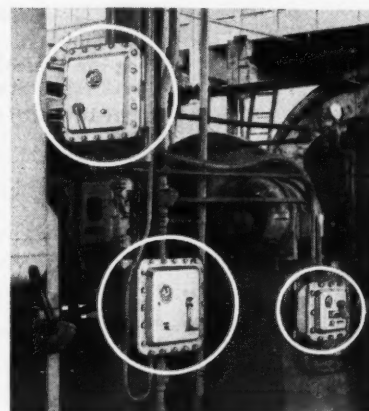
The simple solenoid design—only ONE moving part—is your reliable guarantee for millions of trouble free operations. When you eliminate moving or wearing parts, like pins, pivots, linkages, and bearings, you automatically eliminate possibilities for trouble. Also, Allen-Bradley controls require no contact maintenance. The double break, silver alloy contacts never need filing, cleaning, or dressing. Nor is regular inspection necessary! The contacts are always in perfect operating condition.

Thus, in explosive, dusty, or moist atmospheres, it pays to install Allen-Bradley starters in the correct enclosure. Because Allen-Bradley solenoid controls do not require regular inspection, time lost in removing and replacing bolted covers is substantially reduced. Ask any maintenance man!

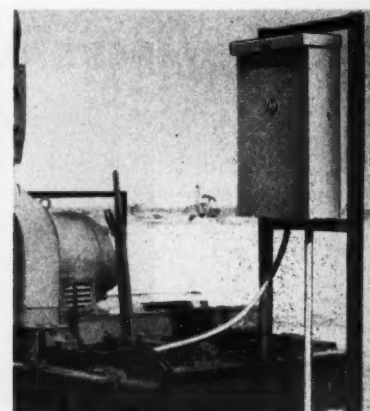
Allen-Bradley Co., 104 W. Greenfield Ave., Milwaukee 4, Wis.
In Canada—Allen-Bradley Canada Limited, Galt, Ontario



Bottle filler operated with Allen-Bradley controls in NEMA 4 watertight enclosures.



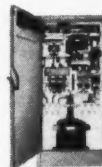
A-B controls in NEMA 7 enclosures for explosive atmospheres installed on ball mill.



In oil field, Allen-Bradley Pump Control Panel in weather-tight enclosure.

Typical Starters

*The Sign
of Quality*



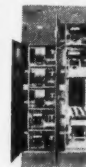
Synchronous Starter



Reduced Voltage Starter



High Voltage Starter



Control Center



Solenoid Starter

Allen-Bradley Solenoid Motor Control

When inquiring check CP 3697 on handy form, pgs. 2-3

ERTEL STAINLESS STEEL Centrifugal & Self-Priming PUMPS

with minimum of parts...

Meet requirements for
handling corrosive liquids in the
Drug, Chemical and Food field.



MODEL SCP
CENTRIFUGAL

MODEL ESP
SELF-PRIMING

Write for fully illustrated Literature

ERTEL ENGINEERING
CORPORATION

KINGSTON 3, NEW YORK
Branch Office & Showroom Located in New York City

COMPLETE LINE OF
Liquid Handling Equipment



When inquiring check CP 3698 on handy form, pgs. 2-3

Instruments for Measuring AIR TEMPERATURE and VELOCITY

TEMPSCRIBE Recording Thermometer

Available in 10 different ranges to cover -30°F to +160°F temperatures, and with spring-operated chart drives for any of the following chart rotations: 8 hours, 24 hours or 7 days.

This entirely self-contained, compact and reliable temperature recorder automatically writes a continuous record of temperature changes on a replaceable chart. Record shows at a glance maximum and minimum temperatures and the duration of temperatures above or below any given point; also shows the exact time of every temperature change and how rapidly it takes place. Recording pen and bi-metallic element are built in hinged, removable door which is also front of instrument. Thus, by merely changing doors it is easy to interchange temperature ranges. Instrument is 8" tall, 5 1/2" wide and 4 1/2" deep. Charts are 4 1/2 inches in diameter.



Write for Bulletin I-715

FLORITE Anemometer

In principle, this unique instrument operates as an anemometer but provides instantaneous, direct readings of air velocity without timing, calculations or reference to charts. Readings are obtained by holding the instrument in the air stream so that air blows against its circular face, causing rotation of a multi-blade rotor mounted in instrument housing. The circular scale surrounding the rotor instantly turns to correct air velocity reading under an index pointer on scale window. Furnished with detachable handle (not shown) and leather case.

Write for Bulletin I-760

BACHARACH Industrial Instrument Co.
7301 PENN AVENUE • PITTSBURGH 8, PA.

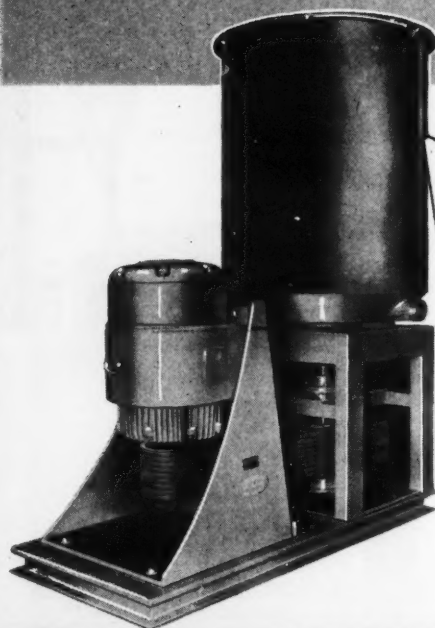


Available in two styles:
One with a scale of 0-1000 ft./min., and the other with a double scale of 0-3000 ft./min. and 0-35 miles per hour.

When inquiring check CP 3699 on handy form, pgs. 2-3

ABBÉ DISPERSALL MIXER...

"Eliminates 2 to 4 handlings of the product, thereby saving considerable labor on every batch"



Gentlemen:

Prior to the purchase of our first Abbe Mixers it was common practice to cook and mix material in kettles, drain into holding tanks and either pump or shovel to roller or ointment mills, followed sometimes by handling into another tank for cooling. From this you can see that with the Abbe Mixer, cooking, mixing, milling and cooling in one machine does eliminate from two to four handlings of the product, thereby saving considerable labor on every batch. In the manufacture of products containing oily substances, this unit has greatly improved the cleanliness of the operation, the floors and the building itself.

Yours very truly,

W. H. H. H. H.

ABBÉ ENGINEERING COMPANY

Address Department 46

50 CHURCH STREET
NEW YORK 7, N. Y.

When inquiring check CP 3700 on handy form, pgs. 2-3

ENGINEERING & MAINTENANCE

(Continued from preceding page)

overflow is kept at a minimum to cut down on water recirculated from sludge tank, affording longer settling time in tank.

Air leaving turbulent layer passes through a bed of larger, dry glass spheres. This bed collects moisture droplets and additional dust, which fall back through air stream to filter bed below.

Constant water flow washes collected dust into sludge tank where it is settled out. Flight conveyor, running continuously, drags sludge out of settling tank and discharges it into container for easy disposal. Where value of product recovered is high, sludge can be filtered.

Water requirements are low and depend on amount of make-up needed to account for evaporation and water removed with sludge. Experience to date shows requirements to be about 1/4 gallon of water per minute per 1000 cfm. Water from sludge tank is recirculated to filter bed above.

This dust collector can be built for various corrosive conditions. Media employed are basically resistant to corrosive action of most materials. Twelve sizes of unit will be available in capacities from 2500 to 25,000 cfm.

(Hydro-Filter is a product of National Engineering Co., Dept. CP, 549 W. Washington Blvd., Chicago 6, Ill. . . or for more information reader may simply check CP 3701 on the convenient Reader Service slip which is located between pages 2 and 3.)

Zinc dust formulation of primer causes it to adhere firmly to galvanized surface

Uses: As a primer for galvanized iron surfaces prior to painting.

Features: Product adheres firmly to any galvanized iron or zinc surface. It gives a durable gray finish that can be covered with enamels or other paints. There is no harmful chemical reaction between primer and either galvanized surface or finish coat.

Description: Formulated on fact that zinc adheres to zinc, primer, called Zincoater, combines metallic zinc dust with a phenolic resin vehicle and tung oil.

Material is easily applied by brush, roller, or spray. Dries to touch in two hours. One gallon covers about 700 to 800 sq ft when brushed on. Available in one gallon cans, it is packaged in a two-compartment container for convenient mixing. Unmixed portions remain stable indefinitely.

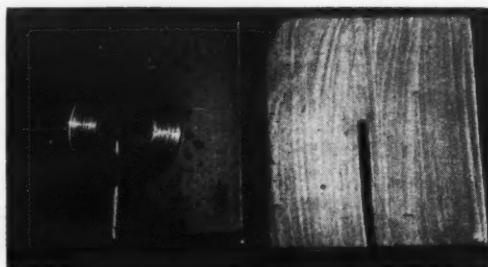
(Primer for galvanized surfaces is a product of Tropical Paint & Oil Co., Dept. CP, 1128-1300 W. 70th St., Cleveland 2, Ohio . . . or for more information check CP 3702 on handy form, pages 2 and 3.)

**Apply tungsten-hard surfacing
at room temperature
with brush . . .**

material is not only abrasion resistant, but also self-lubricating

Uses: Applications now being tested for material include: reducing wear and extending life of relay-latching members in electronic computers; applications where a "case-hardening" effect is desired on brass, plastics, and other softer materials.

Features: Material not only imparts to chosen substrata a hardness and abrasion-resistance almost equal to metallic tungsten, but also is self-lubricating as well. It may be applied by brush, dip, or spray, in any desired thickness.



Hollow steel rod was rotated against brass squares for 20 min @ 1725 rpm under 75 psi. Square on right was protected by hard-surfacing material and was not marked; square on left was worn to depth of nearly 1/16"

Description: Hard-surfacing material, called Tungstide, is metallic tungsten of near-colloidal particle size suspended in an extremely hard liquid plastic. Incorporated in mixture is a hardening form of company's Liqui-Moly, providing a dry, clean, built-in lubrication, with the properties of molybdenum disulfide.

All grades of the material are water- and solvent-resistant, and all may be applied to any clean surface of the appropriate kind.

(Hard-surfacing material is a product of The Lockrey Company, Lubricants Div., Dept. CP, P. O. Box J, Southampton, N. Y. . . . or for more information check CP 3703 on handy form, pages 2 and 3.)

**Shows typical installations
of industrial propellers**

Multi-blade propellers for use in aerating, agitating, mixing, and pumping units are described in brochure. Typical unit-installations are pictured.

"Industrial Propellers" is available on letterhead request to Columbian Bronze Corp., Dept. CP, Freeport, L.I., N.Y.



**SAVE
maintenance dollars with
Wagner Fan-Cooled
Industrial
Motors**



HERE'S HOW -

the Wagner Cartridge Bearing Design cuts your maintenance costs:

Bearings are protected at all times. The Wagner design completely encloses the bearings in a sealed cartridge. Labyrinth seals prevent the entrance of water, dirt and other foreign material. Even when the motor is disassembled, the cartridge remains intact as part of the rotor shaft. The bearing housing stays completely enclosed for full protection against dirt and dust.

Wagner Bearings can be relubricated. When lubrication is necessary to forestall premature bearing

failure in unusually severe applications, readily accessible lubrication openings permit addition of grease or complete relubrication.

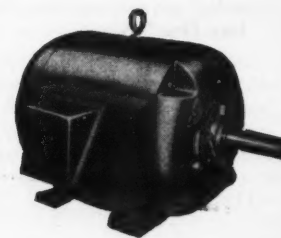
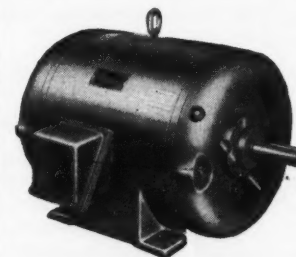
Wagner Bearings run longer between grease periods. Hot bearings shorten grease life. Wagner bearings have a low temperature rise because the design incorporates a deflector shield that directs a cooling stream of air around the bearing housing. Bearings run cooler and longer between maintenance periods.

This cartridge bearing design is a feature of the entire Wagner line of totally-enclosed fan-cooled motors. The line includes standard and explosion-proof steel frame motors, and standard and explosion-proof cast iron frame motors. All types are available with normal torque or high torque characteristics, in ratings to 250 hp.

For complete information—just call the nearest of our 32 branch offices, or write for Bulletins MU-132 and MU-196.



MS4-16

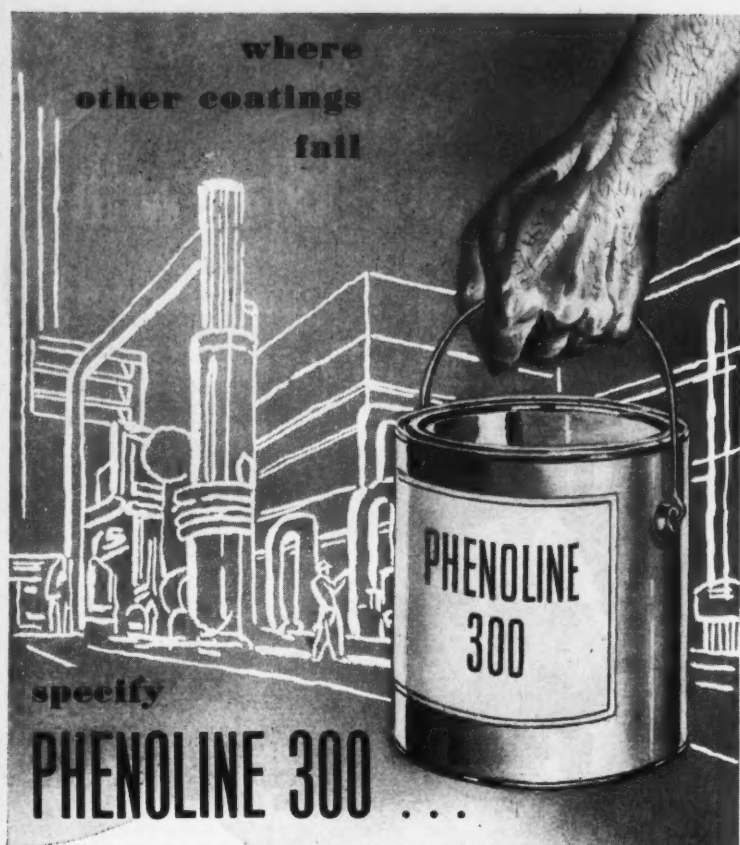


WAGNER ELECTRIC CORPORATION
6359 PLYMOUTH AVE., ST. LOUIS 14, MO., U.S.A.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

ELECTRIC MOTORS
TRANSFORMERS
INDUSTRIAL BRAKES
AUTOMOTIVE
BRAKE SYSTEMS—
AIR AND HYDRAULIC

When inquiring check CP 3704 on handy form, pgs. 2-3



specify

PHENOLINE 300 ...

gives 10 mils thickness per coat
for heavy duty protection of steel
in severe corrosive environments

Heavy duty protection is required for areas in chemical processing plants and other industries where severe corrosive conditions are present (high fume concentration, heavy splash and spillage). Vinyls and other relatively thin coatings, which do not give heavy duty protection, fail in these environments.

But Phenoline 300 (a modified thermosetting phenolic) gives you this vital protection and saves you money, too. Here's why:

10 mils (.010") thickness per coat. This means fewer coats required, lower application cost.
Highly resistant to acids, alkalies, solvents.
100% solids—no special ventilation necessary during application.
Can be sprayed or brushed.
Air dries—no baking required.
Resists sudden temperature changes.
Easy to wash down and keep clean.
Available in all colors.

free

write today for information and literature, including results of impartial tests on 15 different protective coatings, including Phenoline 300, in severe corrosive atmosphere.

carboline
COMPANY

A Division of Mullins
Non-Ferrous Castings Corporation

Specialists
in Corrosion Resisting
Synthetic Materials

333 Thornton Ave., St. Louis 19, Mo.

When inquiring check CP 3705 on handy form, pgs. 2-3

MAINTENANCE

**Flammable chemicals
easily viewed
in tank ...**

explosion-proof unit lights
surface through tank port

Uses: Illumination of tank interiors.

Features: When suspended over tank porthole, fixture illuminates surface of mixture inside tank. Exact state of mixture may be easily observed by operator.

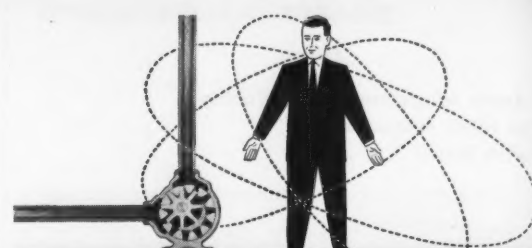


Heavy glass lens of tank light is
heat and impact resistant

Description: Developed to assist processing of flammable chemicals, this explosion-proof pendant tank light is equipped with a Type R 75w, 120v spot lamp. It is machined from cast aluminum. Heavy glass lens is heat and impact resistant.

For chemical processing applications, fixture qualifies for use at Class I, Groups C and D hazardous locations. When installed either in a horizontal or vertical base up position, it is suitable for Class II, Groups E, F and G locations.

(Explosion-proof tank light is a product of Crouse-Hinds Company, Dept. CP, Wolf at Seventh North Streets, Syracuse, N. Y. Check CP 3706 on the handy form, pages two and three.)



YOU'RE SURROUNDED
with products moved
BY VIKING PUMPS

They are everywhere, all around you. The new-born baby starts a life-long series of benefits from Viking pumps. Milk, foods, plastics, soaps, tooth paste, medicines, rubber, paint, gasoline, oils, fuels, fertilizers, asphalt and a host of others ... all are Viking-pumped.

And so throughout your life, Vikings' influence is everywhere ... world-wide. For information, send for bulletin 55SCC.



VIKING PUMP COMPANY
CEDAR FALLS, IOWA

When inquiring check CP 3707 on handy form, pgs. 2-3

OSTER RAPIDUCTION JR.

**THREADS BENT
PIPE...**

**EASILY!
QUICKLY!**



No. 782-R

Revolving die head enables you to thread bent pipe or rods quickly and efficiently. Dies open and close without stopping machine ... fully adjustable for over or undersize threads. Also recommended for threading short nipples, rods, studs and bolts.

Pipe range: 1/2" to 2"; extra range 1/8" to 3/8"
Bolt range: 1/4" to 1 1/2"

Write for complete information and name of your nearest Oster distributor.

THE OSTER MANUFACTURING CO.
Main Office and Factory:
2032 East 61st St. • Cleveland 3, Ohio

Builders of Cost Reducing Threading Equipment Since 1893

When inquiring check CP 3708 on handy form, pgs. 2-3

CHEMICAL PROCESSING

**Where pure product has failed,
material of shredded Teflon
plus binders works**

Uses: Wherever a chemically inert packing is essential — on pumps, valves, agitators, and similar equipment. Product has also proved effective as an emergency packing that can be readily adapted for use wherever time or other conditions make it impracticable to have preformed packing rings made to order.

Features: Where pure Teflon has failed because of cold-flow, lack of resiliency, and compressibility, this shredded Teflon packing has shown excellent results. It is serviceable from -150° to 550°F and can be used on all packing applications (dynamic or static) that require use of Teflon. It is chemically inert and will not be attacked by any organic or inorganic acids, alkalis, or solvents.

Description: Plastic Packing 403 is composed of shredded Teflon combined with suitable binders and lubricants extruded into an open cotton yarn jacket impregnated with graphite. Packing is also available impregnated with mica for use in the food industry or wherever a non-contaminating packing is essential.

Plastic Packing is easily installed by simply cutting in necessary lengths, coiling around shaft, and placing it into stuffing box by any suitable means. This easy installation is made possible by cotton jacket. Material is available for shipment in continuous lengths in sizes of $\frac{1}{4}$ to $\frac{3}{4}$ " in rectangular cross-section by increments of $\frac{1}{16}$ ".

(Shredded Teflon packing is a product of Packing Division, Flexrock Company, Dept. CP, 3611 Filbert St., Philadelphia 1, Pa. . . or for more information check CP 3709 on handy form, pages 2 and 3.)



"A little higher!"

BRIDGEPORT BRASS COMPANY

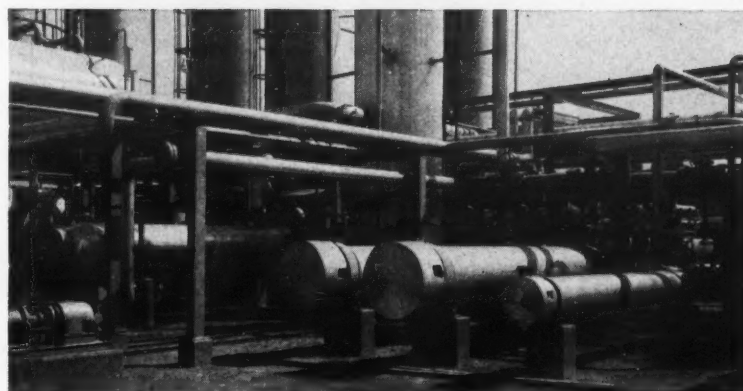
CONDENSER AND HEAT EXCHANGER TUBE EDITION

COPPER ALLOY BULLETIN

BRIDGEPORT
BRASS
CO.

MILLS IN BRIDGEPORT, CONN. AND INDIANAPOLIS, IND.—IN CANADA: NORANDA COPPER AND BRASS LIMITED, MONTREAL

How to Benefit with Bridgeport Duplex Tubes



Bridgeport Duplex Tubes in condensers and heat exchangers mean longer tube life and greater production.

The list of new petroleum and chemical products grows by leaps and bounds every year. And a variety of new corrosion problems is always close behind. Many new and useful end products, derivatives and intermediate fluids require careful selection of condenser and heat-exchanger tube alloys, particularly those with specific corrosion-resistant properties to insure long tube life and greater efficiency. A wide increase in cooling water pollution and a trend toward greater utilization of salt and brackish waters have added heavily to the burden of tube performance. Corrosive attack from both product and cooling water on single-alloy tubes often results in premature failure from attack by one media or the other. Bridgeport Brass has solved many such double corrosion problems by drawing two specially selected alloys concentrically together into double-walled Duplex Tubes.

The use of Duplex Tubes in operations subject to different types of inside and outside corrosion offers many advantages.

Longer Service Life

The alloys selected for Duplex Tubes are each chosen for their specific capacity to handle one particular corrosive media. Admiralty Low Carbon Steel

Duplex Tubes for a cooler handling benzol liquid and sea water are an example. In this case, Admiralty has excellent corrosion resistance to sea water while the low carbon steel carries benzol liquid well. A tight mechanical bond joins the two concentric tubes at a metal-to-metal interface. Each alloy is exposed to corrosion on only one surface, that facing the media it was selected to handle. Thus each alloy can perform to the full extent of its service capacity without exposure to attack from the second media. This fact spells longer service life and lower long-term tube cost.

Lower Maintenance Costs

When tubes are made of alloys specially chosen to handle specific corrosive fluids, it is possible to predict much more closely how long the tubes will perform before they require cleaning or replacement. It isn't necessary to shut down expensive continuous operations for premature repairs. Duplex Tubes, with alloys that match the media, will often reduce the frequency of tube replacement and cleaning maintenance costs.

Improved Products

Single-wall tubes are often made of a compromise alloy—one that will give the best possible resistance to corrosion

from both inside and outside media. The result can be contamination of a highly refined or carefully balanced product. With Duplex Tubes no such compromise is necessary. The alloy facing the product and the alloy facing the cooling or heating media are both chosen on the basis of their compatibility to their respective fluids. An excellent example of the above is the use of Duplex Tubes made up of Stainless Steel/Copper, or Aluminum/Copper for equipment used to process food products, pharmaceuticals and fine chemicals.

Increased Production

Bridgeport Duplex Tubes, in some cases, have higher heat-transfer efficiency than tubes of a single metal. For example, Duplex Tubes made of copper and steel used in an ammonia condenser will give greater operating efficiencies than plain steel tubes, due to the absence of an insulating layer of rust and/or organic fouling from algae and slime on the copper cooling-water side.

Greater Safety

Condenser and heat-exchanger tubes are subject to mechanical stress in operation. The force of flowing fluids, operating pressures and temperatures, and the stress of thermal expansion put added burdens on tube walls. By using Duplex Tubes in such combinations as Admiralty/Steel, Aluminum/Copper, and Monel/Red Brass, the best qualities of strength and resilience, as well as heat conduction and corrosion resistance, are contributed by each metal.

Call on Bridgeport for Service

To find out how you can use Bridgeport Duplex Tubes to your advantage, call your local Bridgeport office. Bridgeport's Technical Service or Corrosion Laboratory is always ready to help you select the right Duplex combination for your service conditions. (2156)



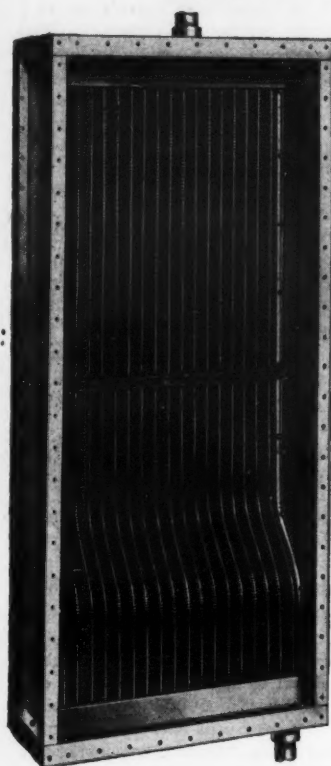
Ask for a copy of Bridgeport's Duplex Tube Technical Bulletin. You'll find it a valuable guide to the selection and installation of Bridgeport Duplex Tubes.

When inquiring check CP 3710 on handy form, pgs. 2-3

EFFICIENT

Extended-Surface

HEAT EXCHANGERS

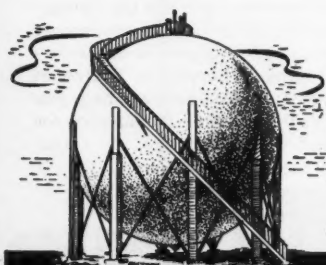


for
**HEATING
COOLING
PROCESS
AIR
CONDITIONING**

ASK THE AEROFIN MAN

Your Aerofin man's recommendation means high efficiency, long service life, low maintenance costs.

Aerofin's unequalled laboratory and manufacturing facilities — unequalled knowledge of heat-exchange practice — are devoted exclusively to the design and manufacture of highest quality extended heat surface.



*Throughout the
Chemical Industry —*

**Aerofin units do the job
Better, Faster, Cheaper**

AEROFIN CORPORATION

101 Greenway Ave.
Syracuse 1, N. Y.

*Aerofin is sold only by manufacturers of
fan-system apparatus. List on request.*

When inquiring check CP 3711 on handy form, pgs. 2-3

MAINTENANCE

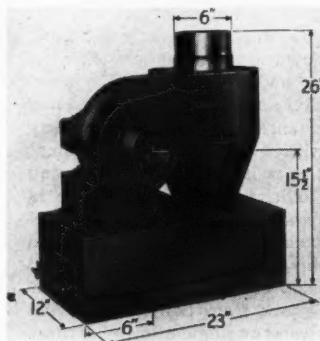
**Compact dust collector
cleans, exhausts air
and gases . . .**

unit may be used where needed

Uses: Exhausting cleaned air and toxic gases outdoors. Unit is designed especially for control of dusts from individual dust creating machines or those remotely located from a general dust control system.

Features: Compactness of unit permits it to be used where several dust sources require control on an alternate basis. It can be furnished caster-mounted for mobility, and with quick-acting clamps for connecting to dust source and to exhaust outlet at any one of several locations.

Description: Self-contained dust collector, designated Model 5N20 Dustkop, is rated at 558 cfm on a 4" inlet. A multiple-blade, self-clearing paddle wheel fan, direct-driven by a continuous-duty 1/3 hp motor, permits collector to be used even where dusts have fibrous content.



Collector can be caster-mounted

Dust, centrifuged out by the cyclone separator which is an integral part of the unit, is retained in dust compartment which comprises entire base of collector. Cleaned air, together with any toxic gases, smoke, and obnoxious odors, is exhausted outdoors through 6" diameter exhaust connection at top.

(Self-contained dust collector is a product of Agat-Detroit Company, Dept. CP, 336 Main at Washington, Ann Arbor, Mich. Check CP 3712, pages 2 and 3.)

Halt Corrosion with sprayable Plastisol Coatings



With the sprayed-on protection of UNICHROME Series 5300 PLASTISOLS, equipment is better prepared for long, trouble-free service in contact with solutions, spillage or fumes of strong corrosives.

These extra heavy duty compounds won't sag even when sprayed up to 25 mils thick on cold vertical metal surfaces. They build up pore-free, chemically inert barriers to acids, alkalis, salts, oxidants and a host of other destructive agents. Send for Bulletin VP-1.

UNICHROME COATINGS FOR METALS

Products of UNITED CHROMIUM, INCORPORATED
100 East 42nd St., New York 17, N. Y. • Detroit 20, Mich. • Waterbury 20, Conn.
Chicago 4, Ill. • Los Angeles 13, Calif. • In Canada: United Chromium Limited, Toronto, Ont.

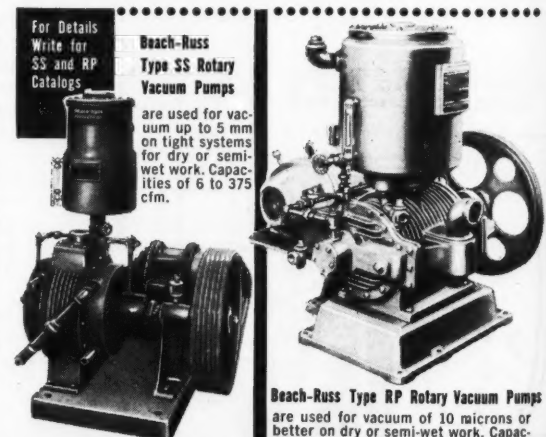
When inquiring check CP 3713 on handy form, pgs. 2-3

SPEEDIER PUMP-DOWN On Dry or Semi-Wet Work...

High vacuum for processing or for getting ready for ultra-high vacuum is obtained faster and at lower over-all costs with

BEACH-RUSS Rotary High Vacuum Pumps

They get the vacuum you want faster than other types and maintain it at the lowest operating and maintenance costs available today. You get far longer service life, too.



BEACH-RUSS COMPANY

50 CHURCH STREET • NEW YORK 7, N. Y.
Address Department 46

When inquiring check CP 3714 on handy form, pgs. 2-3

CHEMICAL PROCESSING

**High-temp, live steam resistance
offered by two adhesives . . .**

bond polyester film to a wide range of papers, plastics, and fabrics

Uses: Bonding du Pont's Mylar polyester film to a wide range of papers, plastic films, and fabrics.

Features: First adhesive, Bondmaster L272, offers high dielectric strength needed for manufacture of laminations used in slot insulations, phase insulation, motors, core and layer insulation in transformers. Material retains full bond strength after constant exposure to 320°F for 672 hr (4 weeks), while offering greater electrical properties than previously existing formulations for this work.

A second clear formulation, Bondmaster L440, is for the bonding of Mylar to paper for sterilization-resistant applications. It is said to retain a strong fiber-tearing bond without discoloring after being subjected to a live steam sterilization chamber for 30 min at 250°F. This resistance to hydrolysis eliminates softness and delamination frequently found when conventional formulations are similarly sterilized.

Description: Application of Bondmaster L272 is by roller coater to film. Film is combined to paper when cement has lost most of solvent, or with 200°F heated squeeze rolls when dry.

Specifications for Bondmaster L272

| | |
|--------------------|------------------------|
| Viscosity (cps) | 7000 |
| Color | Brownish clear |
| Base | Synthetic rubber resin |
| Solvent (clean-up) | Toluol |
| Tack life | Long |
| Weight/gal (lb) | 6-3/4 |
| Solids (%) | 31 1/2 |
| Odor | Faint residual |
| Solvent (dilution) | Naphtha |
| Storage (yr) | One |

Application of Bondmaster L440 is by roller coat, 1.5 to 2 wet mils to paper. It is allowed to dry and is combined with film using nip rolls at 160° - 180°F.

Specifications for Bondmaster L440

| | |
|------------------------|-----------------|
| Viscosity (approx cps) | 5000 |
| Color | Clear or white |
| Base | Synthetic resin |
| Solvent (clean-up) | Ethyl acetate |
| Weight/gal (lb) | 7 1/2 |
| Solids (%) clear | 22 |
| white | 23 |
| Odor | Non-residual |
| Solvent (dilution) | Toluol |
| Storage | Indefinite |

Both adhesives are supplied in 5 gal pails and 55 gal drums.

(Adhesives for Mylar are a product of Dept. P, Rubber & Asbestos Corp., Dept. CP, 225 Belleville Ave., Bloomfield, N. J. . . or for more information reader may simply check CP 3715 on handy form, pages 2 and 3.)



WELDCO USED BY FIRESTONE STEEL PRODUCTS CO. TUBING to Fabricate Army Tank Mufflers

WELDCO Type 430-T Welded Stainless Steel Tubing was used in the tank muffler shown above. It was chosen for **ALL** the tubular parts because it met the heavy-duty requirements of this application. Firestone Steel Products Co., Akron, Ohio, specified WELDCO Tubing because of its exclusive Double-Fusion Weld and excellent fabricating qualities.

WELDCO Pipe and Tubing are available in Monel, Stainless Steel, Hastelloy, Inconel, Nickel, Cupro-Nickel, and Carbon Steel . . . in sizes 3" and larger, in Schedules 5 through 120. In addition, intermediate wall thicknesses and outside diameters can be produced to your specifications. For any special problems or regular applications, always specify WELDCO — Your Best Buy in Top Quality Tubing.

WELDCO

Whatever You Needs In Tubing . . . You're 'Way Ahead With WELDCO

THE YOUNGSTOWN WELDING & ENGINEERING CO.
3718 OAKWOOD AVE. YOUNGSTOWN 9, OHIO

When inquiring check CP 3716 on handy form, pgs. 2-3



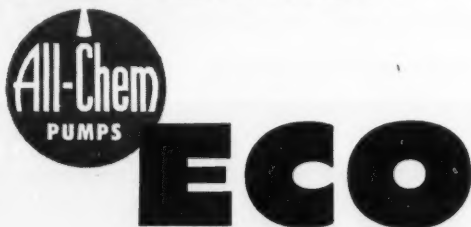
"MIGHTY MITE" SOLVES CHEMICAL PUMP PROBLEMS

The Eco All-Chem Pump is the All-Teflon and stainless steel pump that handles 70 percent of corrosive chemical requirements in Lab., pilot plant and small volume pumping in production service.

Simplify selection; standardize on fewer types, models, sizes; minimize maintenance problems.

READ THE SPECS . . . SPECIFY AND TRY

- **Type Pump:** Positive displacement with two opposed axially oscillating impellers equivalent to duplex piston operation.
- **Volume:** 1/2 to 10 g.p.m. at 1750 RPM (water).
- **Pressures and Temperatures:** Now up to 100 psi. and 212°F. due to improved impeller design and molding technique.
- **Suction Lift:** Highest over widest temperature and viscosity range.
- **Corrosion Resistance:** Lowest corrosion rate due to internal flow pattern.
- **Pump Operating Characteristics:** Linear delivery. No air entrainment. Non-foaming. Unequalled for safety in handling hazardous liquids such as nitric acid and hydrogen peroxide. Self-priming on non-volatile liquids.
- **Drive:** Applicable to direct motor drive at 1750 RPM, as well as to all other standard driving methods.



ENGINEERING COMPANY

12 New York Avenue • Newark 1 • New Jersey

When inquiring check CP 3717 on handy form, pgs. 2-3

MAINTENANCE

Ready-to-use cement saves joining time of PVC pipe . . .

material sets rapidly, gives tough, positive bond

Uses: Joining rigid polyvinyl chloride pipe.

Features: Cement is ready-to-use, offering advantages of time saving and uniform mixing.

Material can be applied easily, sets rapidly, and gives tough, positive bond to joints of rigid vinyl pipe.

Description: Pipe cement, called Plasjoin VC, was formulated in cooperation with B. F. Goodrich Chemical Company. It is available in half-pint, pint, quart, and gallon cans.

(Plastic pipe joining cement is a product of Merritt Products Co., Dept. CP, 1547 East 18th St., Cleveland 14, Ohio . . . or for more information check CP 3718 on handy form, pages 2 and 3.)

Aid in deburring fragile metals or plastics

For use in deburring and polishing fragile parts such as injected molded plastic, small parts from zinc, brass, or aluminum, company has developed a molded nylon tumbling media. Process used will vary with product, but generally it consists of using media, called Nylaslugs, with an abrasive of proper roughness. After thorough rinsing, media are used with a polishing cream, after which they are tumbled with clean hardwood sawdust.

Nylaslugs are available in various shapes and sizes as may be best suited for parts to be deburred and polished.

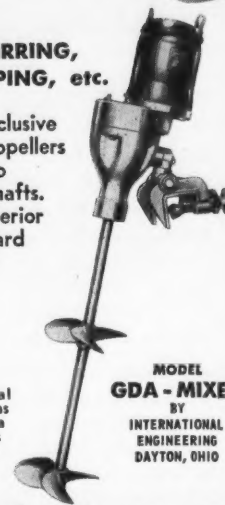
(Molded nylon tumbling media are products of Rampe Manufacturing Co., Dept. CP, 3320 St. Clair Ave., Cleveland 14, Ohio . . . or for more information reader may simply check CP 3719 on handy form, pages 2 and 3.)

SMOOTH—VIBRATIONLESS PROPELLERS

for MIXING, STIRRING, AERATING, PUMPING, etc.

Manufactured by an exclusive process, MICHIGAN propellers are perfectly balanced to avoid whip and strain on shafts. And because of their superior functioning are now standard parts of the products of many leading equipment manufacturers.

Available for special application and replacement, as well as original equipment, in a wide variety of metals and in sizes up to 60". Write for latest data folder.



MICHIGAN WHEEL CO.
GRAND RAPIDS 3, MICH.

When inquiring check CP 3720 on handy form, pgs. 2-3

PROTECT EXPENSIVE GAGES

SPRAGUE SHUT OFF VALVES automatically cut out gages and other pressure-sensitive instruments when fluid pressures go beyond their operating limits. Automatically open when pressure is again within approx. 80% of set cut-out points. Available for any pressure setting between 10 PSI. and 5000 PSI. Save valuable man hours. Eliminate opening and closing manually operated shut off valves. Supplied with standard pipe thread connections, also available with AN tube fittings. Body is 1 1/2" aluminum hexagon stock. Length 5 1/2". Bronze or stainless steel bodies also available. Easy to install. Thousands in use. Write for bulletin.



When inquiring check CP 3721 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Neoprene, Buna-N utilized in V-ring packings

Complete line of homogeneous V-ring packings molded to J.I.C. accepted dimensional standards which correspond to AN-6225 sizes (Army-Navy) is described in 8-page bulletin. Packings are made from two kinds of synthetic rubber. Low friction, low swelling, and high wear-resisting characteristics are reported for rings made using neoprene base compound.

Rings made using Buna-N base compound have been developed to meet need for packings with high oil resistance, but having low friction and high wear-resistance features.

Bulletin on molded hydraulic and pneumatic packings is available from Packing Division, Raybestos-Manhattan, Inc., Dept. CP, Arnold & Stiegel Sts., Manheim, Pa. When inquiring specify CP 3722 on handy form, pages 2 and 3.

**After you've read on article,
do you often . . .**

Want More Information?

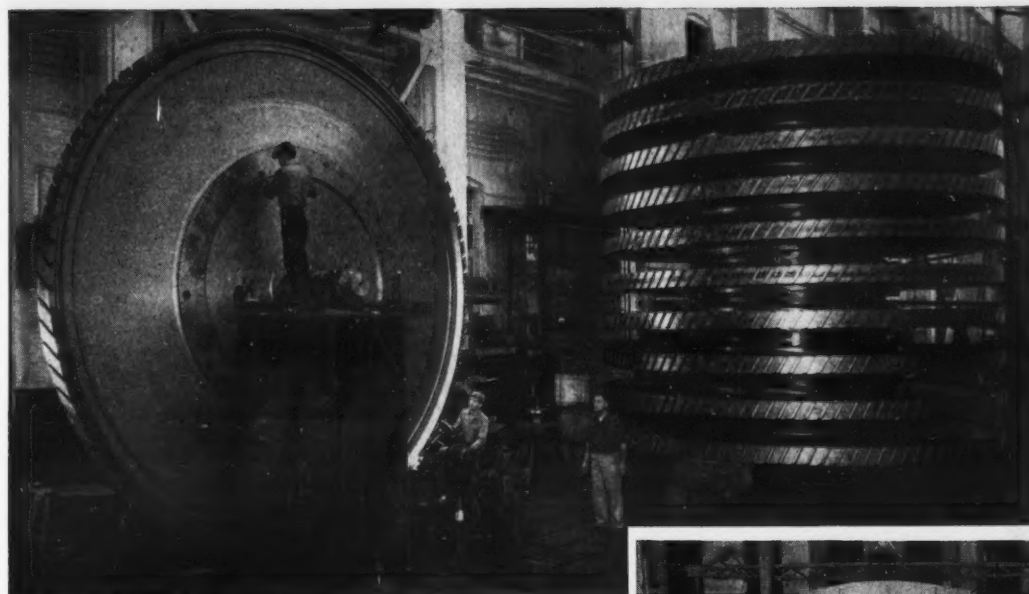
Ever read a magazine article and think — "Now there's something I'd like to know a little more about?"

Probably you have . . . because no matter how long the article, it can't tell you everything. But how do you get more information? Perhaps the magazine didn't tell you . . . and you're too busy to hunt here and there for a name and address . . . a source of further information. So — maybe a good, profitable idea is not followed up, not put into practice in your operations.

When you read **CHEMICAL PROCESSING** you come to no such "dead ends." **Every article has been selected as worthy of your valuable reading time . . .** the non-essentials have been edited out . . . brief, factual material remains. . . **AND**, at the end of every article a "source" paragraph tells you where to get more information.

Convenient for you . . . and **NOTHING MISSING**. Remember, the manufacturer's name and address along with a "key number" at the end of an article is there as an editorial service for you. (Did you wonder, "Is this a new form of advertising?") That information is added to each story by the editors to help you, the reader.

THE EDITORS



Rotor discs for mammoth 11-stage compressor were balanced and stacked for alignment in one of Newport News' five huge machine shops. Large engineering and technical staffs with a vast plant make Newport News an ideal source for large equipment . . . standard or special in design.

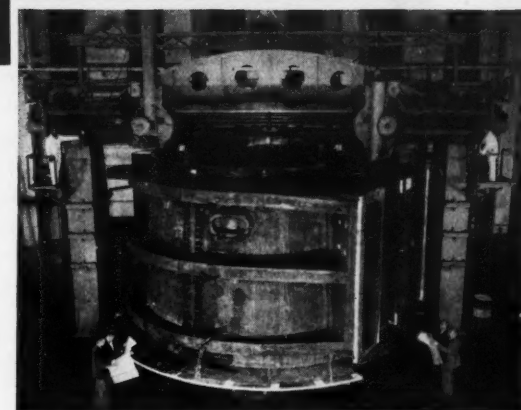
To create winds exceeding **2000 MPH** Newport News builds world's Mightiest Compressor

Whenever you want large units built with careful attention to detail, give the job to Newport News.

This company recently built an eleven-stage axial flow compressor that shatters all previous records for wind force . . . using what is believed to be the world's largest rotating object.

The rotor, weighing more than 400 tons, comprises eleven huge discs. Each disc, machined from a 96,000-pound forging, was finished to a 50,000-pound wheel and balanced to within 26 ounces at the rim. In each rim, slots for blades were machined to within .005" on special milling heads designed and produced in the Newport News plant.

Here at Newport News, you'll find more than large productive capacity. In machine shops, foundries and forging plants Newport News craftsmen complete your orders with specialized techniques backed by experience in fabricating thousands of products.



A 35-foot boring mill in Newport News' plant machining the 374,000-pound upstream housing for the giant axial flow compressor. The compressor is heart of an 8-foot supersonic wind tunnel at the Ames Aeronautical Laboratory of the National Advisory Committee for Aeronautics at Moffett Field, Calif.

Newport News' craftsmen produce units that range from small components of spinning machines, to mammoth hydraulic turbines . . . from piping, pumps and valves, to vacuum tanks, digesters and bridge caissons.

These skilled men handle the job exactly as you want it done, for maximum results per dollar invested. So let us bid on your present or future projects. Learn how Newport News can help you. Send for our illustrated booklet entitled, "Facilities and products" . . . it's your for the asking.

Newport News

**Shipbuilding and
Dry Dock Company**

Newport News, Virginia

When inquiring check CP 3723 on handy form, pgs. 2-3

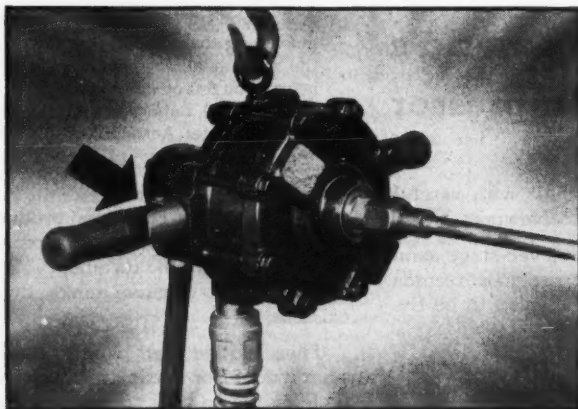
Small tubes clean easy the **LAGONDA** way!



Any tube from 1/2 in. ID up

whether curved or straight, becomes an easy, quick job when you put the right Lagonda cleaner to work. If it's curved, the 600 Series (shown at left) with its slim powerful motor and any one of the many brushes or cutter heads adapted to it, will get around even short-radius curves and leave the tube clean as a whistle. If it's straight, use another 600 Series type, or the Lagonda suspension type cleaner (illustrated below), in which the motor can be air or steam-driven, or electric. Trigger control gives instant speed-up the moment the cutter or drill enters the tube. Controls water supply too.

Lagonda cleaners come in sizes for cleaning anything up to 20 in. pipe.



Get the latest dope on tube cleaning methods — contact your local Elliott representative, or write for bulletin to Elliott Company, Springfield, Ohio.

ELLIOTT Company 

Y3-3

STEAM TURBINES • MOTORS • GENERATORS • DEAIRATING HEATERS • EJECTORS • CONDENSERS • CENTRIFUGAL COMPRESSORS • TURBOCHARGERS • TUBE CLEANERS • STRAINERS

When inquiring check CP 3724 on handy form, pgs. 2-3

MAINTENANCE

Reviews applications of strapping

Eleven kinds of strapping (including stainless, Monel, brass, galvanized, and aluminum) and their uses are described in bulletin. Tools and accessories for strapping application are also discussed.

"Steelbinder Strapping" is issued by A. J. Gerrard & Co., Dept. CP, 1950 Hawthorne Ave., Melrose Park, Ill. When inquiring specify CP 3725 on handy form, pages 2 and 3.

Flexible paper drop cloths are easy to handle and flameproof . . .

afford protection comparable to that of heavy tarp

Uses: In industrial maintenance applications, for protecting machinery or products from dirt, dust, and paint.

Features: Drop cloths give wide-area coverage and also provide flameproof protection. Sturdy wrinkled kraft paper is guaranteed not to flare up or support flame. Plasticizing formula makes the tough paper softer and more flexible for easier handling and draping. It will not scratch or mar furniture or machinery.

Drop cloths are also skid-resistant, providing both a safe walking area and a safe footing for ladders. Despite its light weight, drop cloth affords protection comparable to that of a heavy tarpaulin.

Description: Fibro flameproofed drop cloths are available in 100' lengths, 9, 12, and 15' wide. Several rolls of kraft paper are spliced to form desired width. These widths are then folded to standard 48 or 60" strips which are rolled compactly in 100' lengths for easy opening.

(Paper drop cloths are a product of Fibloco Illinois Corp., Dept. CP, 4646 N. Clifton St., Chicago 40, Ill. . . . or for more information check CP 3726 on handy form, pages 2 and 3.)

Pump liquids, gases, solids in solution



Just place connecting

tubes in
**NEW,
large
Sigmamotor
Pump!**

• Wavelike action of steel fingers forces liquid through the

tubing. Material in tubing never touches pump. Stops contamination and corrosion. Excellent for handling of corrosive solution. **\$195⁰⁰**

Smaller unit with capacities to 30 gallons per hour. **\$55⁰⁰**

SIGMAMOTOR Inc.

18 North Main Street • Middleport, N. Y.

When inquiring check CP 3727 on handy form, pgs. 2-3

ONE COAT KILLS RUST!



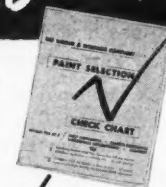
DRIES IN
10-20 MINUTES

TOTRUST

instant-dry METAL COAT | instant-dry ENAMEL

- Rusted* or damp surfaces painted safely
- Highly resistant to chemicals
- Needs no undercoat on bare metals
- Colors: Metal Coat — 8, Enamel — 30
- Quick drying eliminates costly plant shutdowns

*Instant Dry Metal Coat recommended for first coat on rusted surfaces



The Paint Selection Check Chart that enables you to immediately choose which paint products have all your important performance requirements — including cost — for each job.

Send for your copy today!



THE WILBUR & WILLIAMS CO.
BOSTON (BRIGHTON) 35, MASS.

When inquiring check CP 3728 on handy form, pgs. 2-3

CHEMICAL PROCESSING

**Smaller and larger sizes
available in insulation
that snaps on . . .**

applications no longer limited to standard intermediate sizes

Wider range of sizes, from $\frac{3}{4}$ to 24" in diameters for any industrial application, is being offered in company's Snap*On pipe insulation. Product is available in 3 to 6' lengths, depending on pipe size. Small pipe sizes (diameter up to 2") will be in 3' lengths. Wall thicknesses of $\frac{1}{2}$, $\frac{3}{4}$, 1, and $1\frac{1}{2}$ " are available in sizes to 12" pipe size; and 1, $1\frac{1}{2}$, and 3" wall thicknesses for piping above 12" diameter.

Insulation in expanded line retains same features of standard intermediate sizes (from 2 to 10"). Thermal efficiency of product is excellent (K factor of .23 at 100°F mean.) It is virtually immune to damage from wetting or bumping.



Features of intermediate sized insulation are retained

(Pipe insulation is a product of Gustin-Bacon Mfg. Co., Dept. CP, 210 W. 10th St., Kansas City 5, Mo. . . or for more information check CP 3729 on handy form, pages 2 and 3.)

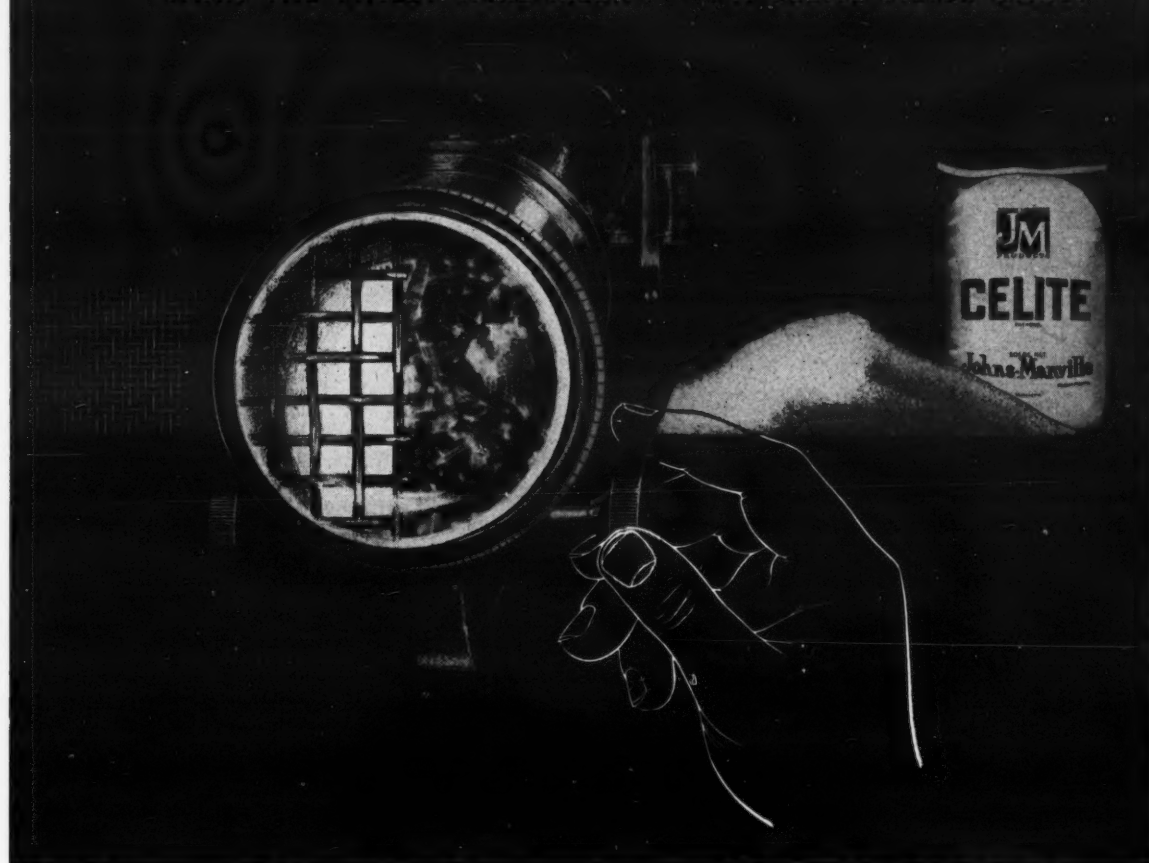
**Low rates of flow controlled
by needle valves**

Design details and operating characteristics of line of needle valves, engineered for applications requiring precise control of low rates of flow, are presented in eight-page bulletin. Reference material includes a table of nominal needle sizes with corresponding valve coefficients, and a characteristic curve showing per cent of maximum flow in relation to per cent of total lift.

Bul 5C-13 is available from The Foxboro Co., Dept. CP, Neponset Ave., Foxboro, Mass. Specify CP 3730, pages 2 and 3.

HUNDREDS OF TIMES FINER

THAN THE FINEST WIRE MESH . . . A CELITE FILTER CAKE!



With Celite Filtration you are assured perfect clarity

HERE is a clarification method which can remove even the finest suspended solids . . . a Celite* Filter Cake contains more than 2,500,000 filter channels per square inch of surface. Here, too, is a method so flexible that it permits the right balance of fast flow rate and high capacity, with the degree of purity and clarity required.

Celite powders may be used with any type of conventional filter. Only 2 simple steps are required. First, a "pre-coat" of Celite is deposited on the filter medium. Second, small amounts of Celite are added to the solution, to form a con-

tinuously fresh filter surface. To meet different filtration requirements, Celite is available in nine standard grades of microscopically controlled particle size. Utmost uniformity is assured by exclusive processing techniques.

The extraordinary efficiency and flexibility of Celite Filtration have made it the standard for entire industries. For perfect clarity in food products such as jellies, sugar, wine, beer . . . for highest purity in antibiotics . . . for removal of impurities from chemicals, petroleum, dry cleaning solvents . . . Celite offers unequalled advantages.

If you want to improve your present filtration system or find an economical way to utilize filtration in your processing, investigate the Celite method now. One of the Johns-Manville Celite Filtration Engineers will gladly discuss your problem. These men are backed by complete technical services and the Johns-Manville Research Center, largest laboratory of its kind in the world. For further information write Johns-Manville, Box 60, New York 16, N. Y. In Canada, 199 Bay Street, Toronto 1, Ontario.

*Celite is Johns-Manville's registered Trade Mark for its diatomaceous silica products.



Johns-Manville CELITE FILTER AIDS

When inquiring check CP 3731 on handy form, pgs. 2-3

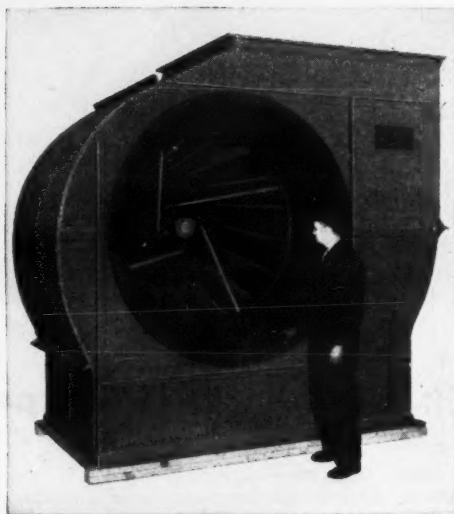
IF YOU HANDLE FUMES CONTAINING

Sulphuric Acid Sulphurous Acid Carbolic Acid
Hydrobromic Acid Hydrofluosilicic Acid Hydrofluoric Acid
Phosphoric Acid Pyroligneous Acid Acetic Acid Citric Acid
Chlorine Oxalic Acid Tartaric Acid Formaldehyde
Nitric Acid Zinc Sulphate Ferrous Chloride Caustic Potash
Ferrous Sulphate Sodium Acid Sulphate Sodium Hypochlorite
Copper Sulphate Zinc Chloride Bleach Liquor
And Other Corrosive Materials —

"Buffalo" RUBBER-LINED EXHAUSTERS Can Save You Real Money

Cost records in hundreds of plants show that "Buffalo" Rubber-Lined Exhausters last from three to twelve times longer than ordinary metal fans, handling the above fumes! Savings far more than pay for the cost of rubber lining, to say nothing of reduction of down-time. Rotor, shaft and inside of housing have a protective coating of rubber vulcanized on, effectively sealing off fumes from the metal. It's just one more example of how the "Q"

Factor* saves you money when you specify Fans by "Buffalo". Write for Bulletin 2424-F for details.



*The "Q" Factor—the built-in Quality which provides trouble-free satisfaction and long life.

BUFFALO FORGE COMPANY

524 Broadway

Buffalo, N. Y.

PUBLISHERS OF "FAN ENGINEERING" HANDBOOK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

Sales Representatives in all Principal Cities

VENTILATING EXHAUSTING AIR CLEANING FORCED DRAFT AIR TEMPERING COOLING INDUCED DRAFT HEATING PRESSURE BLOWING

When inquiring check CP 3732 on handy form, pgs. 2-3

MAINTENANCE

Common brick unharmed by week's immersion in water . . .

silicone coating cuts moisture absorption to 0.01%

Uses: As a water-repellent coating for masonry.

Features: Test results indicate that silicone coating-treated common brick will absorb only 0.01% moisture after being immersed in water for one-week period. Common brick was treated with 5% silicone solids diluted with a commercial solvent.

Coating minimizes efflorescence, retards spalling and cracking, and makes possible cleaner exterior surfaces when properly applied to above-ground brick, concrete, mortar, and other masonry materials.

Description: Designated silicone Dri-Film 103 water repellent, the transparent silicone resin can be applied either by brush or spray. One gallon of diluted material affords a coverage of 75 to 100 sq ft in one coat, on most surfaces.

(Silicone masonry coating is a product of Silicone Products Department, General Electric Company, Dept. CP, Silicone Rd., Waterford, N. Y. . . . or for more information check CP 3733 on handy form, pages 2 and 3.)

Switch gives warning of excess vibration

Economical protection against damage from excess vibration on automatic and rotating machines and other equipment is discussed in four-page bulletin which covers a vibration-responsive device. Unit described is capable of actuation with vibratory displacement increases of less than ten micro-inches at the most sensitive setting.

Bul 500-1 is available from The Beta Corporation, Dept. CP, Forest Ave. at Ridge Road, Richmond 26, Va. When inquiring specify CP 3734 on handy form, pages 2 and 3.

You gotta be first... to be best!*

*25 years ago, Alloy Fabricators started to build Stainless Steel, Monel, Inconel, Nickel and Aluminum Process Equipment. With this experience, naturally, they're your best bet today!

It's Still Our Only Business — And We Mind It Well!



ALLOY FABRICATORS

DIVISION OF CONTINENTAL COPPER AND STEEL INDUSTRIES, INC.
PERTH-AMBOY, NEW JERSEY

When inquiring check CP 3735 on handy form, pgs. 2-3

inexpensive MORSE portable ROTATOR

- MIXES
- BLENDS
- TUMBLES
- CLEANSSES



Model #200 patent-protected

In 30 to 55 gal. drums, 1 to 5 gal. cans at rotating speeds 10 to 40 rpm. The four drive-wheels have Neoprene treads, resistant to paint and oil. The idler wheels have Torrington Needle Bearings for smoother operation. Easily loaded—frame has retractable casters. Various speeds are secured through chain sprocket reduction. Morse Model #200 Rotator weighs 115 lb. Write for Bulletin 348 and free folder showing complete Morse' line or Drum and Barrel Handling Equipment.

MORSE MANUFACTURING CO. INC.

757 West Manlius St. East Syracuse, N. Y.

When inquiring check CP 3736 on handy form, pgs. 2-3

CHEMICAL PROCESSING

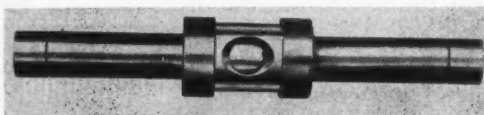
**True diagnosis of fluid charge
assured by double port glass
in liquid indicator . . .**

high-pressure Pyrex glass tubing used is tested to withstand 1000 psi for safety

Uses: As liquid indicators for incorporation into refrigerant or other fluid lines.

Features: All liquid flows through glass and is visible at double port openings in housing. Diagnosis of refrigerant charge is assured.

Description: Liquid indicators use high-pressure Pyrex glass tubing sized to liquid line capacities for full flow of refrigerant or other fluids. Tight seal between glass and housing is maintained by springs, contained within housing, pressing against gaskets — assisted by fluid pressure in line. Safety of the indicators has been demonstrated in hydrostatic tests using pressures up to 1000 psi.



High-pressure Pyrex glass tubing is sized for full flow of fluids

End extension of indicators are sealed with plastic plugs to assure no oxidation of copper, making it easier to solder into line. Any of silver alloy brazing metals may be used for making tight joints without dismantling unit.

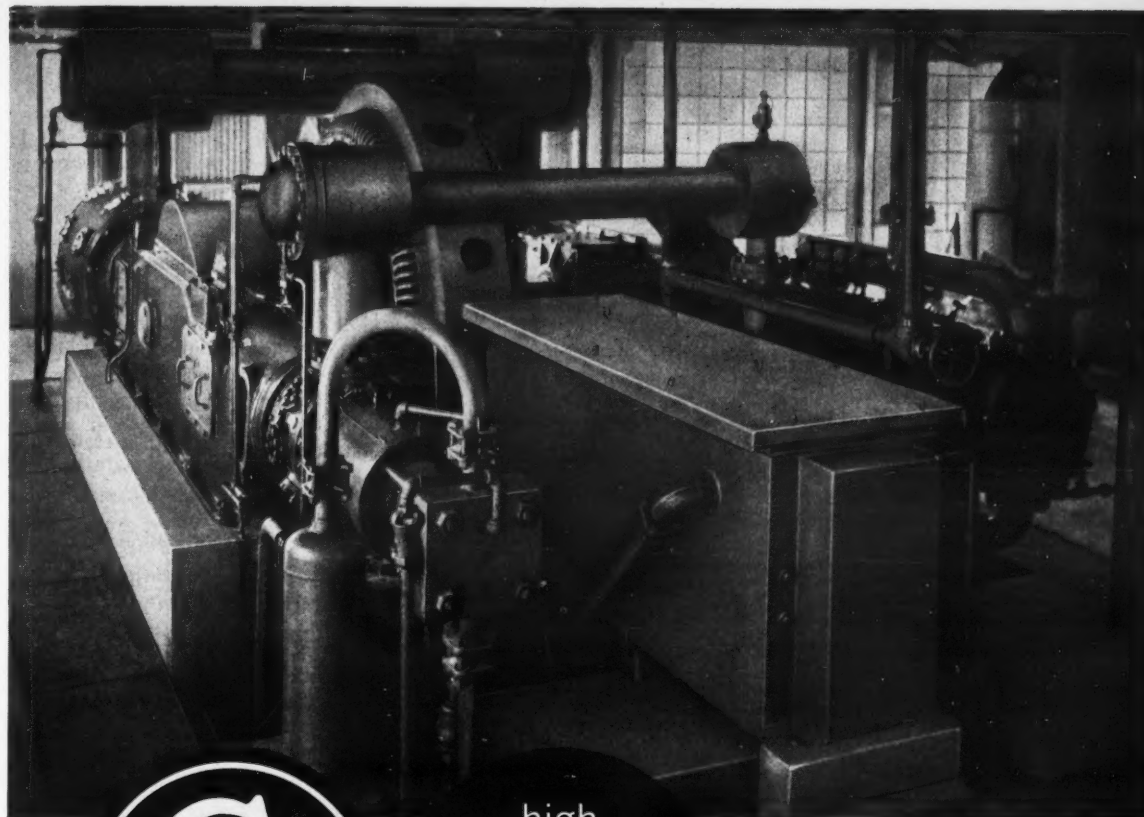
Job-Rated 5000 Series are available in copper tube sizes from $\frac{3}{4}$ through $2\frac{1}{8}$ " and in iron pipe threads from $\frac{1}{2}$ through $1\frac{1}{4}$ ". Larger sizes in both tube and pipe sizes will be produced to order.

(Liquid indicators are a product of Allin Mfg. Co., Dept. CP, 1153 W. Grand Ave., Chicago, Ill. . . or for more information check CP 3737 on handy form, pages 2 and 3.)

**Specially designed equipment
for servicing lubed valves**

Lubrication equipment designed for servicing of lubricated valves is described in comprehensive catalog. Various lubrication fittings, which are inserted in same threads in place of existing lubricant screws on lubricated valves, heavy-duty lubrication guns, both lever and bucket; hose assemblies, follower plates, pressure gages, and other accessories are covered. Applications of all equipment are explained.

Cat 22-170 is issued by Alemite Division, Stewart-Warner Corporation, Dept. CP, 1826 Diversey Pkwy., Chicago 14, Ill. When inquiring reader may simply specify CP 3738 on handy form, pages 2 and 3.



high
pressure
compressors

A typical CP high pressure compressor installation is this horizontal, four-corner, five-stage compressor delivering gas at 3,000 psig. Intercoolers, with extra-large separators, are machine-mounted, simplifying piping layout. Low compression ratio per stage, low rotative speed and roller bearings assure low power consumption and minimum maintenance expense.

... built to deliver up to 15,000 psig

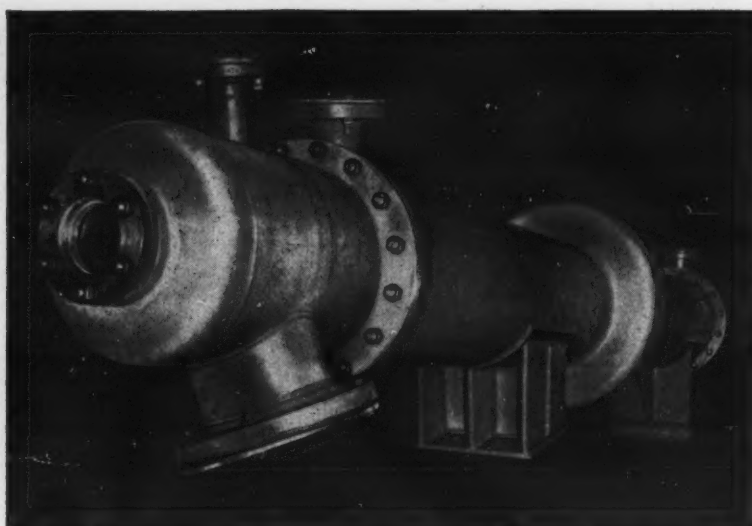
There's a CP Compressor suited to your special requirements for pressures up to 15,000 psig. They're available in vertical or horizontal, stationary, portable, or semi-portable package types . . . liquid or air cooled . . . manual or automatic capacity control with fixed or variable volume clearance pockets . . . electric motor or steam driven. For information write *Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, New York.*



Chicago Pneumatic

PNEUMATIC TOOLS • AIR AND GAS COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS

When inquiring check CP 3739 on handy form, pgs. 2-3



NOW! HEAT EXCHANGERS of Custom-Built Quality At Off-the-Shelf Price and Delivery

Delivery: 2-3 weeks!

Prices comparable to standard units!

Strict adherence to custom-built standards of quality!

These are three of the outstanding advantages of the new line of Downingtown Semi-Standard Heat Exchanger Units. You'll be interested, too, in these additional values:

1. Thickness of tube sheets: $\frac{3}{8}$ ".
2. Thickness of bonnets and channels: $\frac{3}{8}$ ".
3. Any size nozzles—in any location.
4. Stainless nozzles are schedule 40 stub ends (not schedule 10), with ASA lap joint flanges.
5. Meet TEMA Class C Standards.
6. Meet ASME Code. Code stamped for a small extra charge.
7. Final test can be inspected by your representative.
8. Design pressure: 150 psi and up.
9. Expansion joint available for an additional charge.

TUBE SHEET LAYOUTS—NUMBER OF TUBES IN SHELL

| Shell Size | $\frac{3}{8}$ " on $1\frac{1}{2}$ " TRI. | | | $\frac{3}{8}$ " on $1\frac{1}{2}$ " TRI. | | | 1" on $1\frac{1}{2}$ " TRI. | | |
|------------|--|-----|-----|--|-----|-----|-----------------------------|-----|-----|
| | 1P | 2P | 4P | 1P | 2P | 4P | 1P | 2P | 4P |
| 5" | 22 | 20 | 16 | 19 | 18 | 12 | 8 | 4 | 4 |
| 6" | 37 | 30 | 28 | 31 | 24 | 20 | 14 | 14 | 12 |
| 8" | 68 | 66 | 60 | 55 | 48 | 40 | 31 | 26 | 24 |
| 10" | 110 | 106 | 96 | 85 | 76 | 72 | 42 | 40 | 36 |
| 12" | 170 | 156 | 148 | 126 | 118 | 104 | 64 | 64 | 60 |
| 14" | 212 | 196 | 188 | 151 | 148 | 140 | 85 | 82 | 72 |
| 16" | 283 | 270 | 252 | 206 | 196 | 180 | 110 | 106 | 100 |

Standard units are available in steel, or stainless steel, Types 316, 304, 316L, 304L, 347. Above sizes, also available in other alloys; require slightly longer for delivery.

Write today for additional information

Downingtown Iron Works, Inc.

Downingtown, Pennsylvania

New York Office: 52 Vanderbilt Avenue, New York 17, N. Y.

Sales Offices:

235 Hanna Bldg., Cleveland 15 • 936 W. Peachtree St., N.W., Room 126, Atlanta 3
208 S. LaSalle St., Room 796, Chicago 4 • 568 Roosevelt Bldg., Los Angeles 17
18 W. 43rd St., Room 19, Kansas City 11, Mo.

Division of: **PRESSED STEEL TANK COMPANY, Milwaukee 14, Wisconsin**
MANUFACTURER OF HACKNEY PRODUCTS

CONTAINERS AND PRESSURE VESSELS FOR GASES, LIQUIDS AND SOLIDS

When inquiring check CP 3740 on handy form, pgs. 2-3

MAINTENANCE

Describes controls for high pressure

Signal system valves, calibrated controls, and midget valves for high pressure applications are described in two-page catalog. Optional code handles in twelve colors are featured.

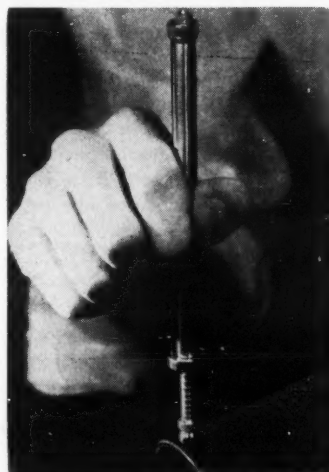
Cat 654 is available from High Pressure Equipment Co., Dept. CP, 1222 Linden Ave., Erie, Pa. When inquiring specify CP 3741 on handy form, pages two and three.

Thickness of coatings determined rapidly with pen-size unit

Uses: To determine thickness of electrodeposited, hot-dipped, or painted coatings on steel and other magnetic metals.

Features: Thickness tester is about the size of a fountain pen. It will test thickness from 0.0001 to 0.15". Accuracy is within 10% for coatings thicker than .0002".

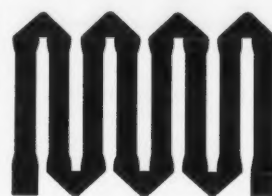
Description: Pocket-size unit, called the Handi-Gage, works on the principle of magnetism. Proper magnet is inserted in gage, magnet end is held vertically on test piece, and gage is pulled slowly away from test piece until magnet releases from surface.



Accuracy of gage is within 10%
for coatings thicker than 0.002"

FOR FASTER HEATING AND COOLING ... BETTER TEMPERATURE CONTROL

TRENT "FOLDED-and-FORMED" Heating Elements



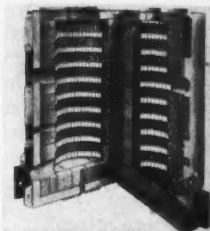
Exposed ribbon type resistor heating elements out-perform sheath type elements where high-temperature, controlled electrical heat is essential for efficient processing operations. The unique construction of Trent "Folded-and-Formed" ribbon type elements further assure maximum rigidity for long-life and low-cost maintenance plus maximum heat transfer and radiation ... greater radiating surface per square inch of element cross-section than any other type of elec-

trical heating element! You get more controlled heat, faster ... at lower costs.

Trent "Folded-and-Formed" Heating Elements are available in easily installed Standard 12" x 12" Racks or Custom-built Racks of any size or shape to exacting dimensional specifications ... for required K.W. at temperatures up to 2000°F.

TRENT ENGINEERING SERVICE

Experienced Trent Heating Engineers will analyze your heating requirements to determine the efficient and economical installation for your operations. Consult our Engineering Department if you have a heating problem, or request to see the new Trent "Folded-and-Formed" Heating Element booklet.



When inquiring check CP 3742 on handy form, pgs. 2-3

WALLS
FLOORS
MASONRY
MACHINERY

Paint on a Tough RUBBER COAT for extra protection!

Now—no more curing delay on new work! Tough new Tropical moisture- and acid-resistant RUBBER-BASE paints, for WALLS: seal "hot spots," stop moisture travel, let you prime, seal, finish-paint same day; for FLOORS: paint new-laid concrete, with dry, gloss finish in 4 hours; for MASONRY: protect from moisture penetration, no streaking, burning, self-cleaning; for MACHINERY: high-gloss enamel for extra protection where moisture, fumes, cleaners, acids attack metals.

FREE! Complete information sent at once—write today!

HEAVY-DUTY MAINTENANCE PAINTS SINCE 1883

TROPICAL PAINT & OIL COMPANY
1128-1256 W. 70th
CLEVELAND 2, OHIO

When inquiring check CP 3743 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Model TA has

What it Takes

to do **TOUGH** mixing

DESIGNED FOR

EXTRA HEAVY MIXING

AGITATOR
PARTS
QUICKLY
REMOVABLE
FOR EASY
CLEANING



GROEN
STAINLESS STEEL
STEAM JACKETED
TWIN-SHAFT
MIXER KETTLE

IT'S A RUGGED, SANITARY UNIT

• Stainless steel from top to bottom. Completely sanitary — conforms to the most rigid Health Dept. requirements. Twin shaft operation for highest efficiency in mixing. Fully enclosed motor drives two shafts: (1)—at slow speed operating Flexible Finger-Like scrapers; and (2)—a secondary high-speed shaft equipped with any of a variety of beaters, blenders or mixers.

• Demountable shaft couplings permit entire agitator assembly to be removed in a few seconds for easy cleaning, and as quickly reinstalled. Cannot disengage in operation. And couplings equal strength of a solid shaft. Read all about this widely famous mixer in Bulletin TAK-2. Write for it now.

GROEN MFG. CO.

4531 W. Armitage Ave., CHICAGO 39, ILL.

30 CHURCH ST.
NEW YORK 7(HALF A CENTURY
OF FINE KETTLES)7 FRONT STREET,
SAN FRANCISCO 11

MAINTENANCE

Calibration exposed on stem is compared with chart furnished with each magnet. Thickness of coating or plate can be read from chart.

(Coating thickness tester is a product of Gardner Laboratory Incorporated, Dept. CP, 4723 Elm St., Bethesda, Md. . . or for more information check CP 3745 on handy form, pages 2 and 3.)

Top shelves a problem?
— handle and step
make reaching easy

To solve the problem of little-used top shelves and give a safe method for workers to reach those shelves, step and handle set is available.

Called the Step-N-Fetch, set is made of steel, cadmium-plated. Sized to the ball of the foot, step screws on easily to all standard metal or wood shelving. It is available in two models, one has a rigid step, the other a flip-up step so that it will be out of the way in narrow crowded aisles.

Handle is right size to grasp firmly. All one has to do to reach for something on a top shelf is to step up with one foot, grasp handle with one hand, and with other free hand lift down item wanted.

(Step and handle sets are available from Narva Products, Inc., Dept. CP, 70 East 45th Street, New York 17, N. Y. . . or for more information reader may simply check CP 3746 on handy form, pages 2 and 3.)

Vibrating equipment illustrated

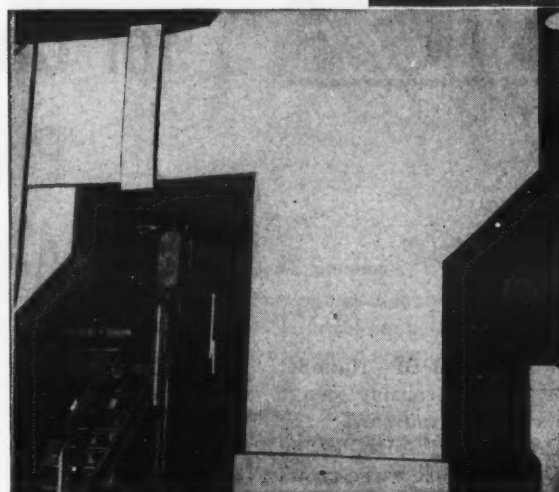
Comprehensive catalog of 230 pages illustrates and describes line of vibrating equipment. Electrically and mechanically vibrated units include feeders, conveyors, coolers, dryers, and mixers.

Cat 870 is issued on letterhead request to The Jeffrey Manufacturing Company, Dept. CP, 956 N. 4th St., Columbus, Ohio.

looking in

CHEMICAL PROCESSING

for ideas?



insulated
with **BH**
Mono-Block
finished
with **BH**
**POWERHOUSE
CEMENT**

BALDWIN-HILL

POWERHOUSE CEMENT.....

INSULATES AND FINISHES

- Easy trowelling... Single coat... Low applied cost.
- Quick hydraulic setting... No drying-shrinkage cracks.
- Weatherproof, "rain-proof" within two hours.
- Smooth surface for oil and water-base paints.

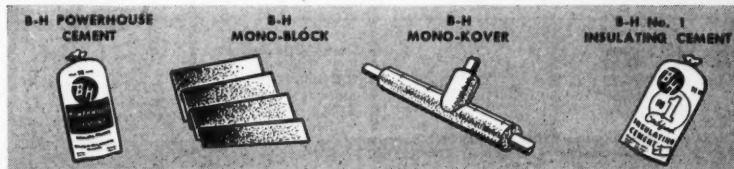


Baldwin-Hill COMPANY

411 BREUNIG AVE., TRENTON, N. J.

Kalamazoo, Mich. • Huntington, Ind. • Temple, Tex.

Send for bul-
letin with
data on com-
position,
properties,
efficiency
and low
applied cost.



When inquiring check CP 3747 on handy form, pgs. 2-3

When inquiring check CP 3744 on handy form, pgs. 2-3

NOVEMBER, 1954

"Plus Sign"

for Chemical Processing Advertisers[★]

The emblem at right is that of NBP—National Business Publications. You've probably seen it before on our contents page . . . rate card . . . or heading the **CHEMICAL PROCESSING** listing in Standard Rate & Data. Because we're proud of it.

It signifies that **CHEMICAL PROCESSING** has qualified for membership in the largest association of technical, scientific and professional journals in the United States. (We're proud, too, that our C. P. executive staff includes a past president of NBP and a member of its Board of Directors.)

But belonging to NBP is more than a feather in our publishing cap. It's an important *plus* for every advertiser in **CHEMICAL PROCESSING**. Here are the membership requirements. Judge for yourself:

- Unbiased editorial content
- Periodic reader interest evaluation
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Chemical Processing

For men who manage
the Chemical Processing Industries

Published by Putman Publishing Company

Creators of PUTMAN-STYLE Magazines
— terse, vital editorial; "hand-picked" circulation;
square, high-visibility format; quality readership;
hence more READER ACTION



★ Courtesy of the publication **MEDICAL ECONOMICS**, creator of this copy, here adapted to **CHEMICAL PROCESSING**.

ENGINEERING & MAINTENANCE

Steam supplied economically by small generator . . .

line of units range from 15 to 30 hp for 125 lb steam applications

Uses: Steam generation for small industrial and commercial applications.

Features: Low-cost steam generator is available in sizes ranging from 15 to 30 hp for high-pressure (125 lb) steam application. Unit can be used with light (No. 3) fuel oil, gas, or combination firing of either oil or gas. Change-over from one fuel to the other on combination firing models is accomplished by throwing a single switch.

Description: Generator, called Steam-Pakette, is small in size with an overall width of 40", height of 58-5/8", and length of 85-3/8". Units are delivered fully wired to control panel, requiring only a minimum of on-the-job wiring. They are built in accordance with ASME boiler code and stamped National Board. Units will meet any state or local ordinance requirements.

(Steam generator is a product of York-Shipley, Inc., Dept. CP, 500 Jessop Pl., York, Pa. . . or for more information check CP 3748 on handy form, pages 2 and 3.)

Removal of cold-working stresses from gas cap of LPG tanks ends cracking problem . . .

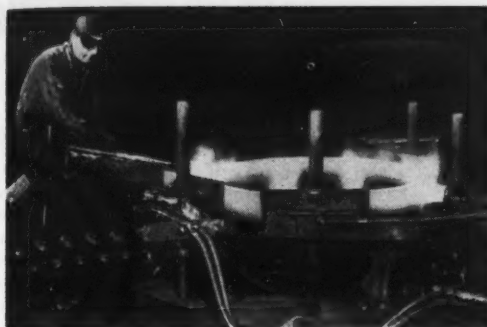
stress-relieving rims assures greater safety, better weldability

For economical reasons, hemispherical heads on high-pressure steel tanks used to store liquefied petroleum gas are usually cold-pressed. This leaves an area along the rim or "equator" more brittle than if it were stress-relieved. If this dome-shaped "gas cap" received a hard bump or bang during assembly operations, cracks often appeared.

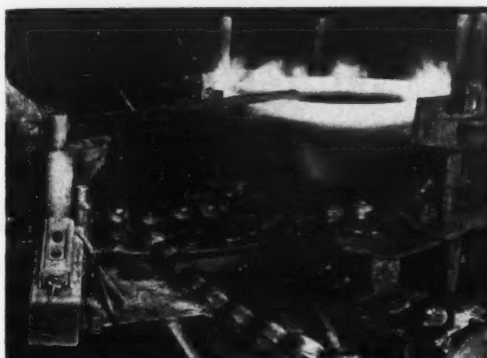
After a thorough study of the problem, company has developed an assembly-line technique of producing stress-relieved rims on these cold-worked domes.



Conveyor brings 40 1/2" heads to gas-fired stress-relieving machine



Battery of gas burners stress-relieves entire rim for depth of about 6"



Stress-relieved "gas cap" leaves heat-treating setup, continues on assembly line

Removal of cold-working stresses (which may run as high as 100,000 psi) gives greater safety, better weldability.

(Procedure for stress-relieving gas caps was developed by Lukens Steel Company, Dept. CP, 1949 Gillen St., Coatesville, Pa. . . . or for more information check CP 3749 on handy form, pages 2 and 3.)

Technical performance data on oil evaporation barrier

Technical performance data on microscopic spheres made of phenolic resin which form oil storage evaporation barrier is presented in 12-page illustrated booklet. Results of extensive field and laboratory tests are graphed and tabulated for ready reference. Properties of spheres and methods of installing them in crude oil storage tanks are also presented.

Booklet on Microballoon spheres (trademark of The Standard Oil Company, Ohio) is available from Bakelite Company, a division of Union Carbide and Carbon Corporation, Dept. CP, 300 Madison Ave., New York 17, N. Y. When inquiring specify CP 3750 on handy form, pages 2 and 3.

Want to forget about rust for 20 years?

Pure zinc or aluminum, molten-sprayed on iron or steel surfaces, provides positive, dependable protection against atmospheric corrosion for upwards of 20 years without *any* further maintenance.

In the chemical field, metallized zinc and aluminum, used with special organic aftercoatings, have proved highly resistant to many corrosives—eliminate undesirable product contamination.

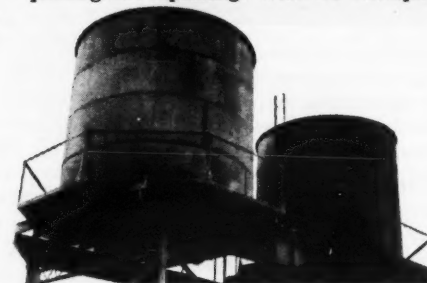
These unique metallic coatings are *mechanically* bonded to the surface—adhesion is *not* dependent on volatile vehicles or binders. Scaling, crazing, blisters are eliminated. Protection is *positive*. "Metallize 'em and forget 'em!"

Why not find out more how you can forget about rust on iron and steel structures and equipment—eliminate the nuisance and expense of constant painting and repainting? Write for descriptive Bulletin 93-X—it's free.

the Metco* Systems

—a series of 18 basic engineering specifications developed over 19 years of experience with pure zinc and aluminum coatings on many different types of structures and equipment in a wide range of corrosive conditions. The *Metco Systems* provide for standardization of surface preparation, coating thicknesses and organic aftercoatings for various surface conditions and appearance requirements.

*Reg. U.S. Pat. Off.—Property of Metallizing Engineering Co., Inc.



Interiors of these two steel 15,000 gallon sprinkler tanks were metallized with zinc in 1934 at the General Mills plant in Buffalo. Last inspected in 1950, no trace of rust could be found, and zinc remaining is expected to provide protection for an additional 15 to 20 years.

here are 11 Metco System contractors

The following organizations are set up to provide positive corrosion protection at lower annual cost in accordance with Metco System specifications. For further information, or copy of descriptive bulletin, contact the Metco System Dept. in the one nearest you.

| Metco System contractors | Baltimore 30, Maryland THE SOUTHERN GALVANIZING COMPANY 1616 Bush Street Tel. Gilmore 7711 | New Orleans 13, Louisiana GULF ENGINEERING CO., INC. 1000 South Peters Street Tel. Canal 4421 | Costa Mesa, California CLARK METALLIZING, INC. 636 West 17th Street Tel. Beacon 5527 | Barberton, Ohio AKRON SAND BLAST CO. 50 E. Springfield Rd. Tel. Plaza 3412 | Buffalo 1, N. Y. METAL-CLADDING, INC. Lakeview & Porter Avenues Tel. Elmwood 9536 |
|--------------------------|--|--|---|--|---|
| | Lincoln Pk. 25 (Detroit), Mich. DIX ENGINEERING CO., INC. 1417 Dix Road Tel. Dunkirk 1-8822 | Philadelphia 29, Pa. MW PROTECTIVE COATINGS DIV. OF METALWELD, INC. Scotts Lane & Abbottsford Ave. Tel. Victor 8-1810 | Chicago 8, Illinois CHICAGO METALLIZING CORP. 2606 West 16th Street Tel. Rockwell 2-2600 | St. Louis 10, Missouri ST. LOUIS METALLIZING COMPANY 625 South Sarah Street Tel. Jefferson 1-5253 | Houston, Texas F. W. GARTNER CO. 3805 Lamar Avenue Tel. Atwood 5338 |
| | | | | | Brooklyn, N. Y. ARTHUR TICKLE ENGINEERING WORKS, INC. 21 Delevan Street Tel. Main 5-4200 |

When inquiring check CP 3751 on handy form, pgs. 2-3

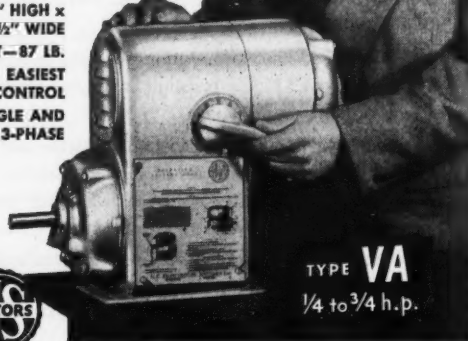
GIVES YOU **ANY** RPM-
AND ONLY 14 1/4" HIGH!

FRACTIONAL
HORSEPOWER
VARIABLE SPEEDS
— IN SMALLEST PACKAGE

4 to
10,000
RPM

IN RATIOS UP TO 10:1

14 1/4" HIGH x
8 1/2" WIDE
WEIGHT—87 LB.
EASIEST
DIAL CONTROL
SINGLE AND
3-PHASE



TYPE **VA**
1/4 to 3/4 h.p.

Here's the lightweight U.S. Varidrive, Type VA, compactly dimensioned to occupy least space, yet suitable for rugged industrial duty just like the larger HP Varidrive line. Compact dimensions and light weight now make built-in application of variable speeds practical.

QUICK, ACCURATE DIAL CONTROL

Full speed range instantly obtained in less than one turn of dial handle. The stationary dial plate is precisely calibrated for close setting, yet easily visible from a distance.

GETS YOU MORE PRODUCTION

You can greatly increase the performance and output of your machine using fractional horsepower with Type VA. Your operator can control the speed to a split rpm to accomplish better workmanship and to gain more output.

U. S. ELECTRICAL MOTORS INC.
Los Angeles 54, Calif. Milford, Conn.

U.S. VARIDRIVE MOTORS

| | | | | |
|--|-----------|---|------|-------|
| | REQUEST | U. S. Electrical Motors Inc. Box 2058, Los Angeles 54, Calif. or Milford, Conn. | | |
| | VARIDRIVE | NAME | | |
| | BULLETIN | COMPANY | | |
| | | ADDRESS | | |
| | | CITY | ZONE | STATE |

When inquiring check CP 3752 on handy form, pgs. 2-3

ENGINEERING & MAINTENANCE

Economical thread repairs made possible by handy maintenance kit

Economical, handy kits have been designed to provide maintenance man with a quick solution to his tapped thread repair problems in the industrial plant. Company offers choice of two kits for plant maintenance use: the 34CS kit with inserts and tools in four sizes, and a wider range kit containing inserts and tools in eleven sizes.

(Thread repair kits are a product of Heli-Coil Corporation, Dept. CP, 954 Shelter Rock Lane, Danbury, Conn. . . . or for more information check CP 3753 on handy form, pages 2 and 3.)

Noise from air-actuated devices cut by muffler which minimizes vapor spray . . .

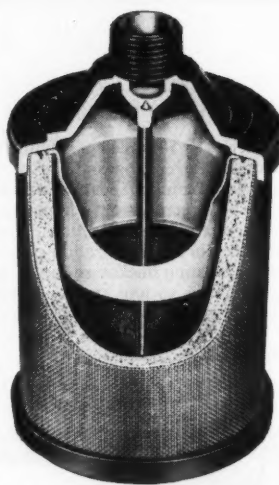
aluminum deflector forms an acoustic chamber and acts as condenser

Uses: Elimination of noises caused by high velocity discharge from air-actuated devices.

Features: Muffler operates on company's opposed radial-flow silencing principle. It employs an aluminum deflector shield designed to form an acoustic chamber to minimize direct contact of disseminator by high velocity air stream, without sacrificing radiation surface. This shield also acts as a condenser to precipitate moisture present in air system holding vapor spray to a minimum.

Description: Design characteristics of the HC model muffler do not restrict full volume air flow. Minimum back pressure is maintained. Units can be affixed directly to exhaust aperture and will operate satisfactorily in any position, requiring no additional piping. Mufflers are available in sizes ranging from 1/8 to 2" standard pipe size.

(Exhaust muffler is a product of Allied Witan Company, Dept. CP, 4315 West 138th St., Cleveland 11, Ohio . . . or for more information check CP 3754 on handy form, pages 2 and 3.)



Muffler will operate satisfactorily in any position



CUTTING COMPLAINTS

A pinch of dust or grit at your assembly line inspection bench or in the packing and shipping room can cause very expensive service calls later on. Spencer Vacuum is easily piped to each room and bench. It will speed production—save time in general cleaning and with special attachments, can collect water, pick up welding flux, reclaim materials and do 130 other jobs that are too expensive by hand. Ask for Bulletin No. 144.



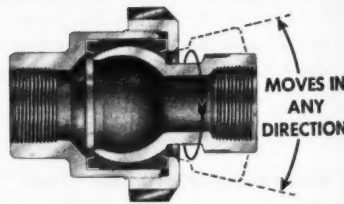
THE SPENCER TURBINE COMPANY • HARTFORD 6, CONNECTICUT
SPENCER
HARTFORD 466-H

When inquiring check CP 3755 on handy form, pgs. 2-3



Flexible BALL JOINTS

— when
you need
movable
joints in
piping
handling



STEAM, OIL, CHEMICALS



Send for
New Bulletin
No. 215

- Provides for movement in piping—up to 40° side flexibility, plus 360° rotating movement.
- Stainless steel and chemically inert gaskets for strong chemicals. No metal-to-metal contact. Choice of body materials.
- One Barco Ball Joint does the work of two or more ordinary swivel joints because "it moves in any direction!"
- Many models available. For pressures to 7,500 psi; temperatures to 1000°F. 15 different sizes. 1/4" to 12". Ask for recommendations. BARCO MFG. CO., 537M Hough St., Barrington, Illinois.

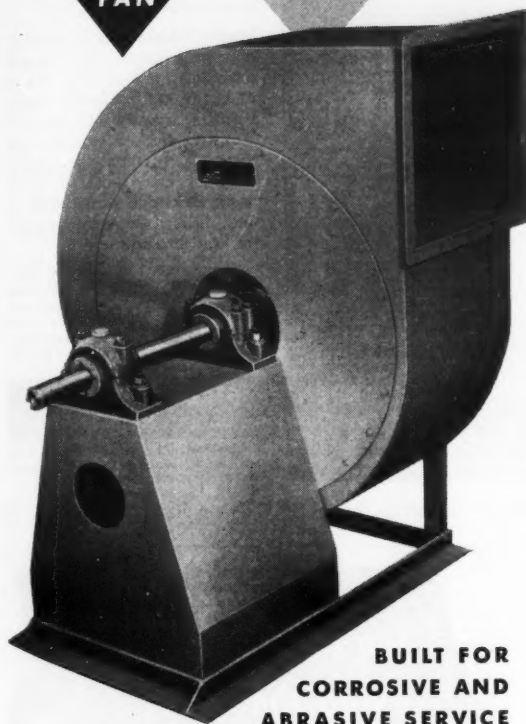
THE ONLY TRULY COMPLETE LINE OF FLEXIBLE
BALL, SWIVEL, SWING AND REVOLVING JOINTS

When inquiring check CP 3756 on handy form, pgs. 2-3

CHEMICAL PROCESSING

FOR EXHAUSTING CORROSIVE FUMES

USE THIS
RUGGED
FAN



**BUILT FOR
CORROSIVE AND
ABRASIVE SERVICE**

Furnished in a wide variety of sheet lining materials — or lighter protective coatings to fit your requirements.

Fan and housing constructed of extra heavy metal especially for lining applications.

All units statically and dynamically tested after lining application — assuring dependable long-life performance.

Consult a Heil Engineer for complete engineering service for your corrosive and ventilating requirements on solid Plastics or Lined Steel Exhaust Hoods, Ducts and Stacks.

Write Dpt. CPM for additional data on our complete line of Chemical Proof Equipment



HEIL PROCESS EQUIPMENT

12905 Elmwood Avenue • Cleveland 33, Ohio

Representatives in all Principal Cities

When inquiring check CP 3757 on handy form, pgs. 2-3

NOVEMBER, 1954

MAINTENANCE

**Fire and water resisted
by thermosetting
cement paint . . .**

gives a smooth, hard finish
to wood and masonry

Uses: Application on wood, masonry, concrete, fiber board, and various insulating materials. Mixed with sand or asbestos fibers, it can be used to patch or build up concrete, porcelain, etc.

Features: Surfaces coated with material can be subjected to open flame and resist penetration by water. This cement paint gives a smooth, hard, decorative finish.

Description: Plasticized thermosetting cement paint, called Ceramiseal, is packaged as a dry powder. It is mixed with water for brush or spray application, or it may be used thick for application with trowel. Colors are easily added to match existing surface.

(Cement paint is a product of Culberg Asbestos & Cork Co., Dept. CP, 1402 N. Halsted St., Chicago 22, Ill. . . . or for more information check CP 3758 on handy form, pages 2 and 3.)

**Coil burn-out stopped
on solenoid valve . . .**

pilot operation plus short
stroke nips trouble

Problem of coil burn-out has been eliminated from explosion-proof solenoid air valves by combining an extremely short solenoid stroke with pilot operation.

Poppet design with linear sealing contact on resilient seats makes both pilot and main valve self-scavenging. Cover of explosion-proof housing is removable for quick access to solenoid. Coils are interchangeable, making it easy to convert to any standard voltage by a simple coil change.

(Explosion-proof solenoid air valves are products of Barksdale Valves, Dept. CP, 5125 Alcoa Ave., Los Angeles 58, Calif. Check CP 3759, pages 2 and 3.)

THIS IS REALLY CONTINUOUS FILTRATION



21 FEET OF UNBROKEN FILTER CAKE

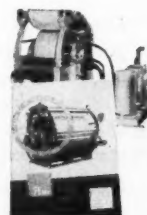
24 HOURS A DAY . . . with FEinc STRING FILTERS

The clean, unbroken sheet seen here is composed of refined kaolin which is coming off the discharge end of a FEinc String Filter at J. M. Huber Corporation, Huber, Ga. The uniformly dewatered cake, although of a sticky character, is cleanly lifted from the revolving filter drum by closely spaced strings which carry the clay blanket to the discharge roll, where it drops into the trough.

The FEinc String Filter is successfully delivering cleaner, dryer cakes with materials ranging all the way from thin, soupy slimes, colloidal gels, greasy waxes, etc., to flocculent, fibrous or crystalline cakes . . . with less "down time" and lower maintenance costs. In a surprising number of cases this FEinc is the most economical of all filters for the "easy" jobs as well as the tough ones.

The FEinc String Discharge Filter is only one of many continuous filters now made by Filtration Engineers. Our engineering service is the finest available, backed by 35 years of experience, and backed by the ability to deliver filters that are tailor-made to fit the job . . . at no more than standard costs. Write or telephone us today for more details.

Test the actual performance of FEinc . . . at low cost . . . rent this small pilot-plant filter with interchangeable string or scraper discharge. Write for facts.



Filtration Engineers, Inc.

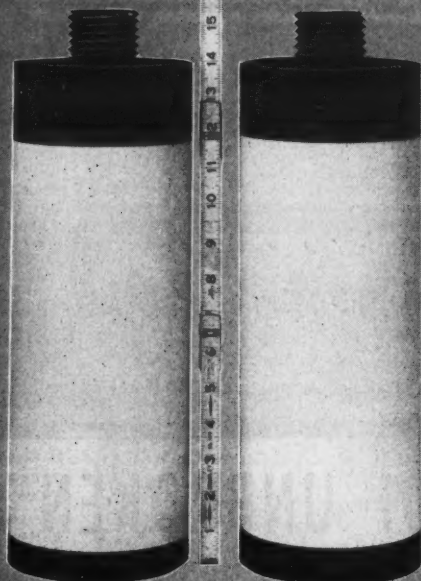
CUSTOM DESIGNERS AND MANUFACTURERS OF ALL
TYPES OF CONTINUOUS FILTRATION EQUIPMENT

FEinc

42 155 ORATON STREET • NEWARK 4, N. J.

When inquiring check CP 3760 on handy form, pgs. 2-3

SPECIAL Ceramic PARTS OUR SPECIALTY...



Porcelain Pistons produced by McDanel—service life of 5 years compared to less than one year for steel.

YOU SKETCH IT— WE'LL MAKE IT

Maybe you have considered a high strength, high temperature ceramic (porcelain) for a part but couldn't find a manufacturer to produce the part. That's McDanel's business—special ceramic parts with particular emphasis on oil field and ceramic applications, such as: pump cylinder liners; valve seals; flow chokes; pump plungers; gun nozzles; or perhaps a part never made before. Just sketch it and send along. Whether you need a special shape, special mix, special die or special body... McDanel can do.

Nothing can match ceramics in the proper application, for resistance to abrasion, corrosion, friction or high temperature.

Prompt response to your special inquiry.

McDANEL
Industrial
PORCELAINS

McDANEL
REFRACTORY
PORCELAIN
COMPANY
BEAVER FALLS, PENNA.

When inquiring check CP 3761 on handy form, pgs. 2-3

ENGINEERING & MAINTENANCE

Fine crystalline coating provided by material sprayed on zinc gives good paint bonding

Product for use in producing a phosphate coating on zinc provides a fine crystalline coating which serves as an excellent base for subsequent painting operations. Mixed with water, it is applied by spraying. While designed specifically for use on zinc surfaces, product, called Fosbond 61, may also be used on steel. This permits its use in operations where both steel and zinc are being processed.

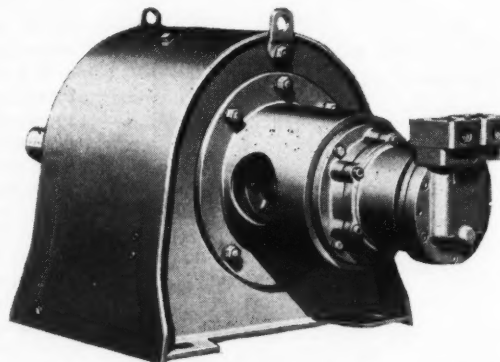
(Phosphatizing compound is a product of Pennsylvania Salt Mfg. Co., Dept. CP, 1000 Widener Bldg., Philadelphia 7, Pa. Check CP 3762, pgs. 2-3.)

Accuracies from 0.1 to 0.5% offered over wide range by speed reducer...

motor and reducer combine to make compact output unit for drives

Uses: Typical applications include drives on can fillers, can closers, extractors, extruders, compressors, pumps, and conveyors.

Features: Units are most useful on drives where accuracies of from 0.1 to 0.5% are essential or advantageous over a wide range of loads and speed ratios, or where a number of sections of a machine are to be synchronized at different speed ratios.



Maximum output speed of drives ranges from 1.7 to 1170 rpm

Description: Company's line of Type H fluid power, constant displacement, axial piston motors and Falk's complete line of concentric and right angle all-steel reducers are combined into line of integral Oilgearducers, compact output units for company's variable-speed drives.

Motors, in sizes of 1, 3, 8, 12, and 20 hp are flanged and resilient-coupling connected to Falk single, double, triple, and quadruple reducers with ratio

Solution to a Hot Solution Problem



Carpenter Stainless No. 20 Handles Hot Sulphuric Acid—Solves Corrosion Problem

In this spray booth, metal parts are cleaned by a solution of hot sulphuric acid. Booth is fabricated from Carpenter Stainless No. 20 pipe, tubing, sheet and plate for longer equipment life, reduced maintenance.

Highly resistant to concentrations or solutions of H_2SO_4 , and unaffected by a long list of other highly corrosive acids, liquids, gases, Carpenter Stainless No. 20 cuts the cost of corrosion control. It has the ductility and general workability for trouble-free bending, machining, threading, welding and brazing.



Write for NEW Carpenter Stainless No. 20 bulletin containing data on physicals, corrosion resistance, fabrication.

THE CARPENTER STEEL COMPANY
Alloy Tube Division, Union, New Jersey

FOR INFORMATION on Carpenter Stainless No. 20 bars, strip, wire and billets, contact The Carpenter Steel Company, Reading, Pa.

When inquiring check CP 3763 on handy form, pgs. 2-3

MAKE You can save money and time with MARMAN Band Clamps

Quick-Coupler Clamp...a Marmar design for instant removal and installation...Stainless Steel...tough, corrosion resistant, vibration proof.

There is a Marmar design for every clamping operation. Order quick-coupler clamp direct from this advertisement. Write, wire or phone for catalog or engineering assistance. CP-1154

| SERIES NO. | 360 | 365 | 450 | 455 |
|------------|--------------------|--------------------|---------------------|---------------------|
| MIN. WIDTH | 3/4" | 3/4" | 3/4" | 3/4" |
| BAND GAGE | .020 | .020 | .025 | .025 |
| BOLT SIZE | 10-32NF-2 x 1 1/4" | 10-32NF-2 x 2 1/4" | 1/4-20NF-2 x 2 1/2" | 1/4-20NF-2 x 3 1/2" |
| MIN. DIA. | 2 | 3 | 4 | 7 |

MARMAN
PRODUCTS CO., Inc.
11214 EXPOSITION BLVD.
LOS ANGELES 64, CALIF.

When inquiring check CP 3764 on handy form, pgs. 2-3

comb
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combinations providing maximum output speeds from 1.7 to 1170 rpm. Normally continuous operation output torques ranging from 42 lb-in to 41500 lb-in are based on a pressure of 1100 psi. Starting and peak torques for intermittent service can be up to 60% higher.

(Gear reducer line is manufactured by The Oilgear Company, Dept. CP, 1560 West Pierce St., Milwaukee 4, Wis. . . . or for more information check CP 3765 on handy form, pages 2 and 3.)

Required triple impact resistance offered by tough, non-metallic rigid piping . . .

thermo-plastic material is chemical-resistant, odorless, rot-proof

Uses: Primarily for use in industrial and chemical plants, other applications foreseen for material include structural paneling, instrument cases, shipping containers, valves and fittings, corrosion-proof nuts and bolts. Excellent electrical properties of rigid plastic suggest its use in electrical panels, switch frames, and plates.

Features: Thermo-plastic material makes available a non-metallic pipe that is tough, durable, and capable of withstanding rough handling and hard usage under severe operating conditions. Pipe has three times impact resistance established by Society of Plastics Industry as standard for high impact materials.

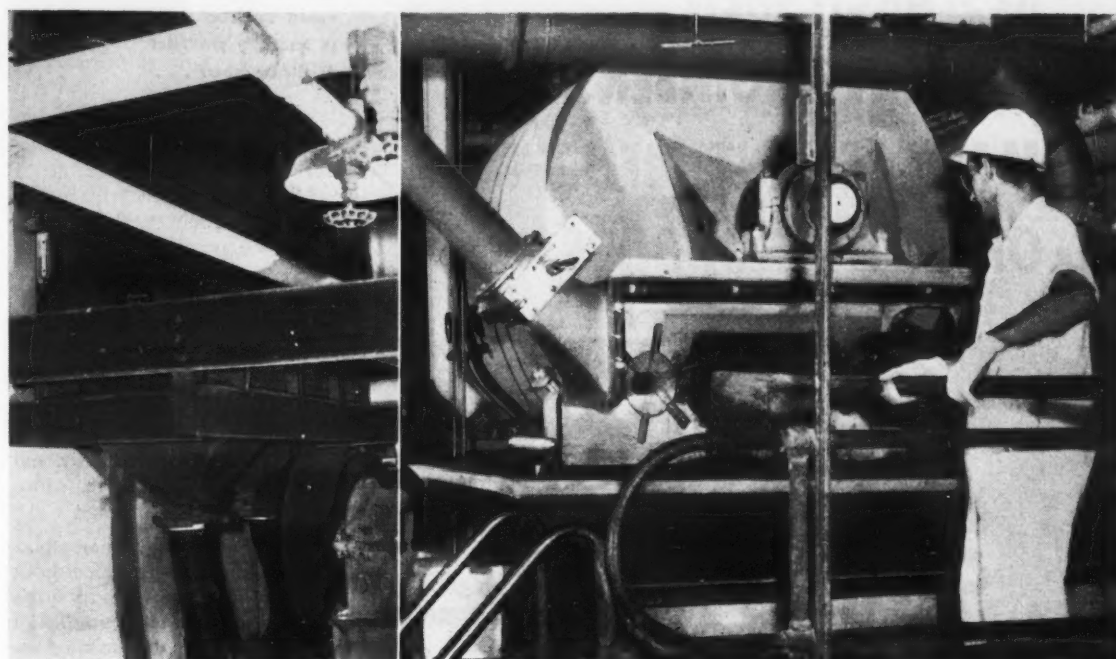
Material is chemical-resistant, odorless, will not rot, rust or corrode and has excellent aging properties for indoor, outdoor, and underground applications.

Description: Rigid Koroseal pipe and fittings weigh only about a quarter as much as standard steel pipe, but in many services are said to outlast steel, copper, cast iron, or stainless steel. Pipe is available in lengths up to 20' and diameters from 1/2 through 2". It is furnished with threaded fittings so that systems may be disassembled and reused. Assembly is rapid and requires no special skill or tools.

Pipe is gray in color, with a smooth shiny surface inside and out. Standard vinyl-base paints may be used where necessary to meet color codes. Pipe can be bent by heating to 250-300°F and bending around a form of proper radius. Flanged connections are recommended for joining pipe to other pipe systems. Threaded joints can be chemical- or heat-welded for permanent installations and standard metal pipe compounds can be used for temporary joints.

(Rigid plastic pipe is a product of Industrial Products Division of The B. F. Goodrich Company, Dept. CP, 448 S. Main St., Akron, Ohio . . . or for more information reader may simply check CP 3766 on handy form, pages 2 and 3.)

pioneering developments keep DUSTUBE® first in dust control



Salvaging Valuable Aureomycin Dust

Lederle Laboratories Use Wheelabrator Dust Collectors to Improve Working Conditions, Cut Material Costs

Three rotary vacuum dryers are used at Lederle Laboratories to dry animal feed grade Aureomycin Chlortetracycline.

During manual unloading of the dryers, fine particles of dust would billow up and disperse into the working areas obscuring vision and causing loss of valuable material.

Proper hooding of the unloading areas with ductwork leading to a high efficiency Wheelabrator Dustube cloth-type collector traps and collects all dust.

Personnel and housekeeping problems have been solved and the dust collected is returned to appropriate product batches.

The cloth tubes in the Wheelabrator Dustube Collector are shaken clean before the type of material run through the dryers is changed, preventing any mixing of products.

Unloading product dryers in plants manufacturing any of the chemical, food or pharmaceutical products is liable to pro-

duce the heavy dust that creates difficult working conditions and demands costly housekeeping programs.

You, too, can have thorough, economical dust collection by using Wheelabrator Dustube Collectors to solve your problems. Because of their simple design, these cloth-tube type collectors cost less to install, operate and maintain than other types of dust control equipment. Investigate Wheelabrator Dustube Collectors today.



Write for your copy of Catalog 372 today.

American dustube
WHEELABRATOR & EQUIPMENT CORP. COLLECTORS

478 S. Byrkit St., Mishawaka, Indiana

When inquiring check CP 3767 on handy form, pgs. 2-3

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Call on
PROCTOR & SCHWARTZ

to gain advantages of an organization
with largest aggregate of

"EXPERIENCE YEARS"

in application of drying equipment
in the chemical industry

PROCTOR equipment is at work in all branches of the process industries: heavy chemicals, pharmaceuticals, plastics, foods, leather, synthetic textiles, rubber manufacturing, glue and gelatin, and many other related industries.

PHONE MICHIGAN 4-6400 OR WRITE

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711 TABOR ROAD
PHILADELPHIA 20, PA.

When inquiring check CP 3768 on handy form, pgs. 2-3

MAINTENANCE

**Field-spliced cable
is factory perfect
without heat . . .**

method embeds splice in liquid epoxy resin

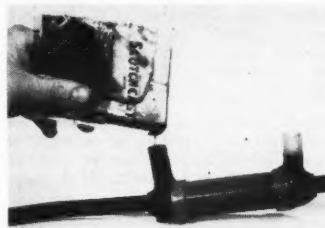
Uses: Splicing cable, from wire sizes 10 to 4 AWG, in factory or field.

Features: Splicing method involves embedding splice in liquid epoxy resin that hardens into a hermetically-sealed casting. No heat is required.

Used in convenient kit form, it allows plastic-jacketed splices in a matter of minutes, protected and insulated against moisture, corrosion, and electrical leakage.

Description: Kit used in splicing method is called Scotchcast No. 82A. Basis for method is firm's electrical embedment resin No. 4 available in a plastic mixing envelope. This provides mixing of resin and hardener in exactly right proportions. All materials necessary for making a complete cast splice in single conductor cable are included in kit. No tools are required other than a pocket knife.

In use, mold pieces are slipped on ends of wire, insulation penciled down, and spring connector turned on with fingers. After pulling plastic mold units into place over connection, inner partition in container is ruptured by squeezing, and resin and hardener thoroughly mixed by simply kneading contents.



Plastic-jacketed splice is made in minutes

Activated resin is poured into one of spouts on mold. Resin sets up within 5 to 15 min, depending on temperature, and plastic mold is left in place, since it provides added protection.

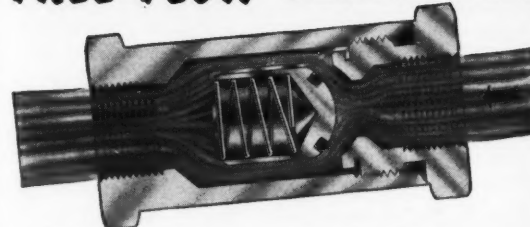


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When inquiring check CP 3769 on handy form, pgs. 2-3

REPUBLIC VALVES
INDUSTRIAL • CHEMICAL • AIRCRAFT

FREE-FLOW CHECK VALVE



- Very low pressure drop
- Leakproof "O" ring seal
- 1/4 psi Opening pressure
- 0 to 3000 psi service
- Small in size

- Aluminum alloy, brass—
Other materials to order
- Sizes 1/8" to 1"
- Any combination of tube
and pipe ports.

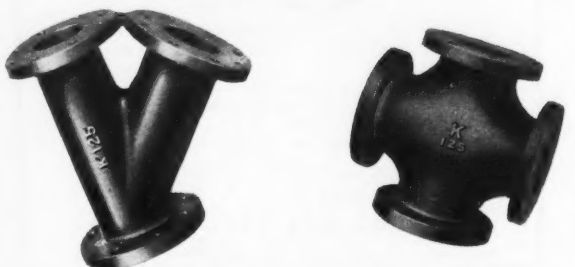
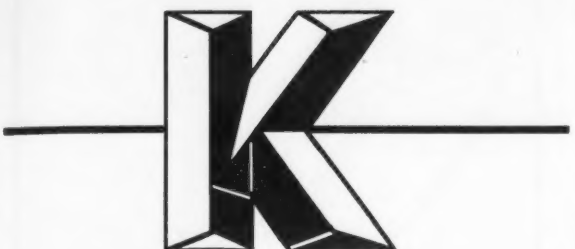
Write for complete catalog and nearest distributor.



RM
REPUBLIC MANUFACTURING CO.
15635 BROOKPARK ROAD • CLEVELAND 11, OHIO

When inquiring check CP 3770 on handy form, pgs. 2-3

CHEMICAL PROCESSING



Our Guarantee... Your Safeguard

The "K" on a pipe fitting is our signature—and behind that "K" we stand four square. A host of distributors also back precision-made "K's" right up to the hilt and they emphasize these three vital points.

"K's" are tough—close-grained and symmetrical.

"K's" have uniform walls and high tensile strength.

"K's" are precision-made—faces of flanged fittings accurately milled—bolt holes evenly spaced—threads tapped full and clean.

If you would avoid time losses and grief tell your distributor that you want the fittings that carry the "K"—the fittings that have passed critical inspection. That's the Kuhns line of fittings—a leader for nearly 70 years.

K PIPE FITTINGS CAST IRON AND MALLEABLE 3,000 Shapes and Sizes

Catalog upon official request.

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KUHN
BROTHERS
COMPANY**

1801 McCall St.
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Established 1887

**Stocks in Dayton
Los Angeles
Oakland, Calif.
Branford, Conn.**

MAINTENANCE

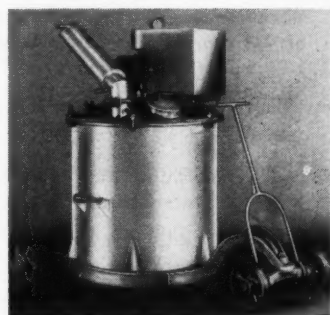
Entire operation takes from 10 to 20 min and backfilling may begin immediately after pouring if desired.

(Cable splicing kit is a product of Minnesota Mining and Manufacturing Co., Dept. CP, 900 Fauquier St., St. Paul 6, Minn. . . or for more information check CP 3772 on handy form, pages 2 and 3.)

Synthetic resin kettle offers air or electric motor drive . . .

choice governed by production requirements

Stainless steel synthetic resin kettle, available in capacities up to 750 gal, is offered with either air motor or electric motor drive. Choice of drive is limited by production requirements.



Kettle driven by explosion-proof electric motor which drives turbine agitator

Air motor gives infinite variations of speed. Peripheral agitator blade velocities can be regulated between 0 and 750 fps. Valve throttle device sets and maintains any speed within range.

Standard speed requirements are met with explosion-proof electric motor driving a turbine agitator.

(Synthetic resin kettles, called Low-Boys are products of Dept. 2, Brighton Copper Works, Inc., Dept. CP, 820 State Ave., Cincinnati 4, Ohio . . . or for more information reader may simply check CP 3773 on handy form, pages 2 and 3.)



light weight...
quiet...
high speed...
fast cleaning...

the AIRETOOL CC-4325 Condenser Tube Cleaner

Now . . . a condenser tube cleaner that's lighter than ever . . . that makes cleaning completely choked tubes up to 1" a strictly one-man proposition! Easily hand-held . . . no cumbersome supporting rig needed. Extremely mobile and flexible in operation.

The CC-4325 is quiet; driven by a powerful two-stage, muffled, air motor with a built-in flushing system that insures cooler running of the drill. A quick shut-off sleeve valve controls the flushing agent, and a trigger type valve controls motor speed. When used with a carbide tip drill, the CC-4325 makes short work of cleaning tubes completely choked with hardest deposits.

The New CC-4325 Condenser Tube Cleaner is only one of the new developments of The Airetool Mfg. Co., for many years leaders in the field of tube cleaning and expansion tools. There's an Airetool tube cleaner and expander for every type of tubular construction . . . Write for complete details.



BRANCH OFFICES: New York • Chicago • Philadelphia • Tulsa • Houston • Baton Rouge
Representatives in principal cities in U.S.A., Canada, Mexico, South America, England, Japan

When inquiring check CP 3774 on handy form, pgs. 2-3

When inquiring check CP 3771 on handy form, pgs. 2-3
NOVEMBER, 1954

THE DYNACLONE

PATENTED

The ULTIMATE in Dust Filters



HOW IT OPERATES

- Dust laden air is drawn in from the dust sources as indicated by the shaded arrows.
- It is diffused into the dust chamber by the baffle plate.
- It is then drawn through the fabric of the filter bags and is cleaned as shown by the clear arrows.
- Clean air passes out of the case and goes to the suction fan.
- Concurrently, the traveler moves back and forth across the dust wall registering successively with one bag at a time.
- The suction which exists in the dust chamber draws a blast of atmospheric air through the bag in reverse directions and cleans that bag. (No shaking.)

Control your industrial dust better, for less — with the Sly Dynaclone. May we explain how?

SEND FOR BULLETIN NO. 102

THE W. W. SLY MANUFACTURING CO.
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SLY

PIONEERS & LEADERS
in INDUSTRIAL DUST CONTROL

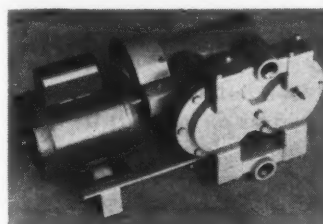
When inquiring check CP 3775 on handy form, pgs. 2-3

MAINTENANCE

No harm done pump if operated dry

Uses: Pumping chemicals, caustics, and petroleum products.

Features: Unit uses no packing glands or seals and is leakproof. It is impervious to abrasions, self-priming, and can be operated dry without harm.



Pump develops 72% efficiency at 50-lb head pressure

Description: Pumping unit, designated Model 80-50, uses vertical diaphragms. It is capable of developing 72% pumping efficiency at 50-lb head pressure. Capacity at this pressure is 700 gph with speed of 483 rpm. Unit is powered with a 1/2 hp AC electric motor.

(Diaphragm pump is a product of The Perry Company, Dept. CP, P. O. Box 2057, Waco, Texas . . . or for more information check CP 3776 on handy form, pages 2 and 3.)

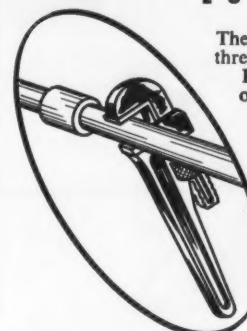
Shell molding pictured

Advantages of shell molding over other casting methods are described in a 25-minute sound slidefilm entitled "Shell Molding and You." Included in the visual presentation is a brief, interesting history of metal casting in cartoon form, showing how shell molding fits into the evolution of metal casting techniques.

Sound slidefilm on shell molding is produced by Chemical Materials Dept., General Electric Co., Dept. CP, 1 Plastics Ave., Pittsfield, Mass. When inquiring specify CP 3777 on handy form, pages 2 and 3.

loosen 'em up . . .

with **MOLYKOTE**
LUBRICANTS



The results of tests made on threaded connections at 1000° F. for 5000 hours (and others at even higher temperatures) are yet unmatched by any other lubricant.

Whenever comparison tests are made MOLYKOTE is usually specified for extreme bearing pressure or high temperature applications

MOLYKOTE, Type G, contains a high concentration of molybdenum disulfide, and is unexcelled in

- anti-seizing properties
- low coefficient of friction at extreme bearing pressures
- chemical and thermal stability.

Send for your FREE SAMPLE today!

the **ALPHA** corporation
STAMFORD, CONN.

When inquiring check CP 3778 on handy form, pgs. 2-3

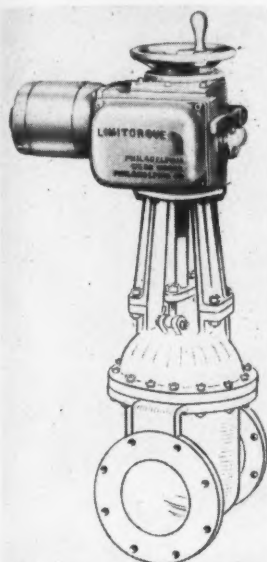
SPRACO NOZZLES

Write for NOZZLE CATALOG to
SPRAY ENGINEERING CO.
125 CENTRAL STREET • SOMERVILLE 45, MASS.

When inquiring check CP 3779 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Torque applied to valve parts limited by controller



Handwheel is provided on valve controller for manual operation if necessary

Uses: Motorized operator for small valves ranging from 1½ to 8" part diameters.

Features: Unit limits amount of torque applied to valve operating parts. Amount of torque or stem thrust may be accurately adjusted for varying service conditions through a micrometer "torque switch."

Description: Motorized valve operator, called the Limit-Torque, may be controlled electrically from any conveniently located pushbutton station. In case of power failure, a handwheel is incorporated in control unit for manual operation if necessary.

(Valve controller is a product of Philadelphia Gear Works, Dept. CP, Erie Ave. and G St., Philadelphia 34, Pa. . . or for more information check CP 3780 on handy form, pages 2 and 3.)

Outlines characteristics of ball valves

Principal technical section of eight-page bulletin is devoted to operating characteristics of manually-operated ball valves. Various applications as well as engineering data are also given.

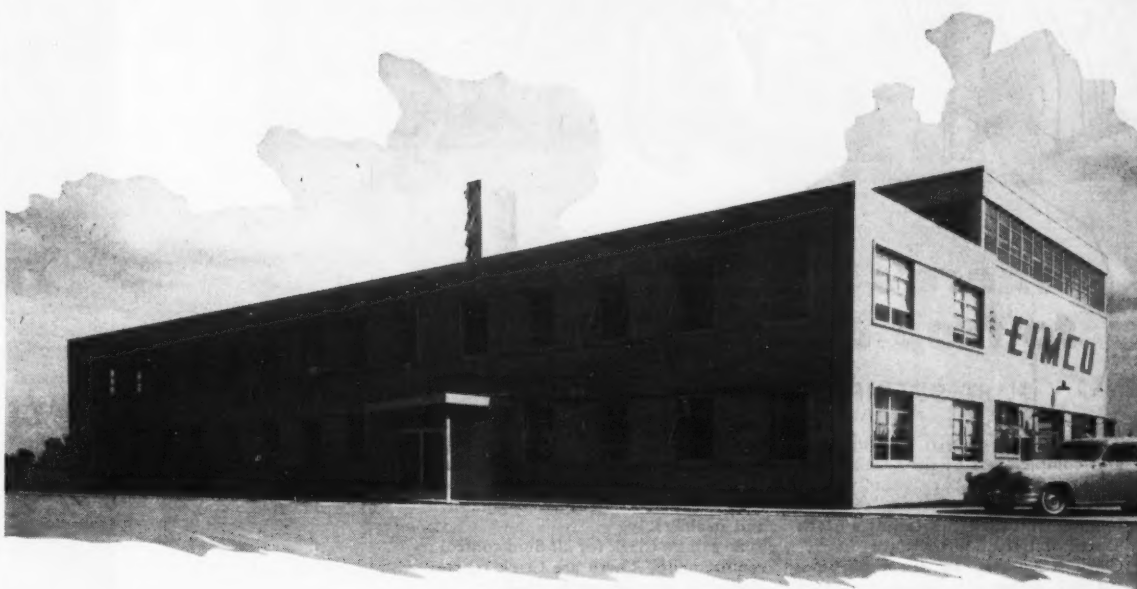
Bul 159 is issued by Valve Div., S. Morgan Smith Co., Dept. CP, York 8, Pa. When inquiring specify CP 3781 on handy form, pages 2 and 3.

Your guide to more ideas concerning Engineering and Maintenance . . .

is the handy Product Directory on page 213 to 216. All products and services discussed in this issue, in either editorial or advertising, are listed there — in alphabetical order for your convenience.

A RESEARCH AND DEVELOPMENT CENTER

the first of its kind in the field of Vacuum and Pressure Filtration.



This is a view of our new Research and Development Center for the benefit of industries concerned with liquid-solids separation through vacuum or pressure filtration.

The new building will also house the Central Division headquarters for sales and service on all Eimco equipment.

Complete pilot plant facilities are available at the Center for development of new processes and new equipment to make the process developed workable and efficient.

Capable engineering and research personnel

staff the Center. These men have many years of research experience and more than half a century of Eimco's experience in service to the industries interested in and requiring this type of research.

Located at 301 South Hicks Road at Palatine, Illinois, a Chicago suburb, the Center is easily accessible by train, bus or automobile (only a few minutes from the "Loop.")

You are urged to visit these new facilities and use them in any way to make your work easier in solving problems of liquid-solids separation through filtration.

THE EIMCO CORPORATION

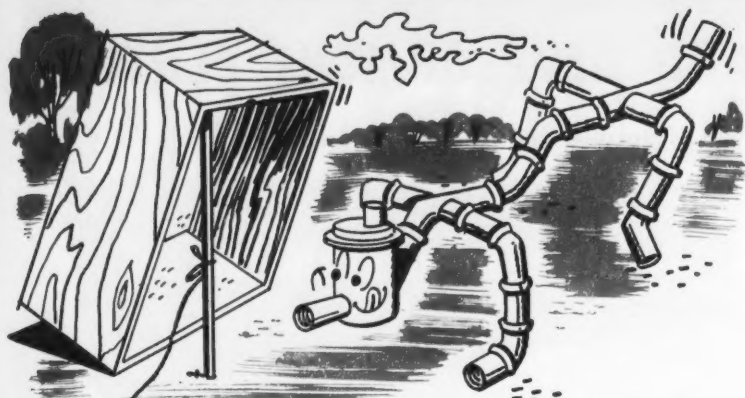
Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

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You Can't Beat An Eimco!

When inquiring check CP 3782 on handy form, pgs. 2-3



there's a **RIGHT** way to trap a Steam Line!

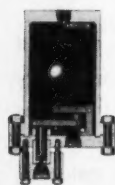
JUST SPECIFY Clark CONTROLS

Thanks to the proven dependability and completeness of the Clark steam trap and regulator lines, power engineers can meet most of their requirements simply by calling a Clark representative. For there's a "right" Clark steam trap for every purpose.

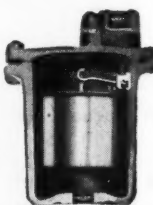
Clark makes the famous patented Duo-Step inverted bucket traps that

handle *double* the usual amount of condensate. In addition, Clark manufactures open bucket and float type traps as well as pressure regulators and strainers.

So call on Clark for *all* fluid control requirements. There are Clark representatives in most major cities.



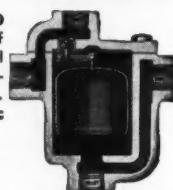
SERIES "450" FLOAT TRAP. For drainage where continuous flow is desired, or for maintaining liquid levels. Steel construction for pressures to 600 P.S.I. Compound linkage gives larger capacity. Size $\frac{1}{2}$ " to 2".



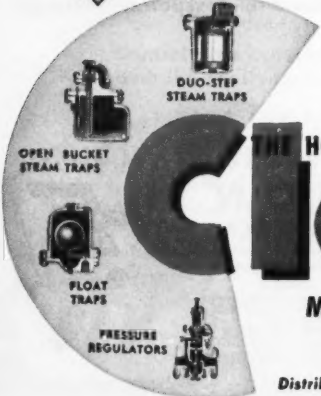
SERIES "80"-D (DUO-STEP) TRAPS. Cast semi-steel construction for pressures up to 250 P.S.I. and temperatures to 450°F. Equipped with Duo-Step Leverage and Venting, Clark-loy seats and discs. Pipe sizes from $\frac{1}{2}$ " to 2".



"Y" SELF-CLEANING STRAINERS. Remove dirt, scale and grit from steam, fluid and gas lines. Sizes $\frac{1}{2}$ " to 3" I.P.S.



SERIES "60" INVERTED BUCKET TRAP. Choice of horizontal or vertical inlet or outlet. For pressures up to 150 P.S.I. "Clark-loy" guided disc and seat.



Clark

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CLEVELAND 14, OHIO

Distributors and Representatives in all major cities

When inquiring check CP 3783 on handy form, pgs. 2-3

**engineering and
maintenance**



Use of versatile fittings at plastics plant —

cuts pipe assembly costs 50 per cent

**Longer straight section
simplifies installation
and minimizes welding**

Problem: In order to maintain the product purity required for its resin, a large plastics plant in the East had to prevent contamination in piping system. Decision was made to use stainless steel piping. However, conventional stainless piping and fittings were high in initial cost and would be costly to assemble.

Solution: Since results of using Schedule #5 Type 316 stainless steel piping and Speedline fittings at another one of its plants in 1950 had been quite satisfactory, company recently completed a similar installation at

its new plant. Upper photograph shows piping which carries the resin to be polymerized to the charge system. Resin is transferred at room temperature and 200 psig. Schedule #5 is light-wall, lightweight piping which has adequate strength, yet is economical. High flow and capacity as well as flexibility in installation are permitted by the light-wall piping.

Key advantage of the Speedline fittings is the longer straight section or "tangential feature." This additional clearance facilitates insertion into flanges, simplifies curved joints, and minimizes welding. Piping system can be assembled by expanding or rolling in pipe if desired. Insert flanges and aligning connector can also make installation easier.

CHEMICAL PROCESSING

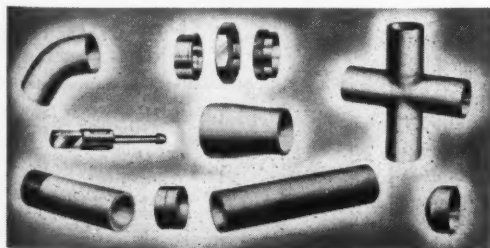
NOV



In the installation at the plastics plant, inserts were welded to pipe only and not to flange, so that the flange could be rotated for easy aligning. In this case it was not necessary to use aligning connectors, eliminating a double job of welding. Pipe is welded end to end, only one welding operation being required.

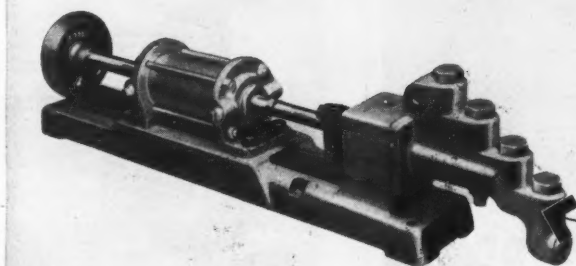
Results: It is estimated that use of the Speedline fittings effected a 50% cost savings in assembly. Any possibility of contamination, as well as corrosion, has been eliminated.

(Light-wall pipe and Speedline fittings supplied by Horace T. Potts Co., Dept. CP, Erie Ave. & D St., Philadelphia 34, Pa. . . . or for more information check CP 3784 on handy form, pages 2 and 3.)



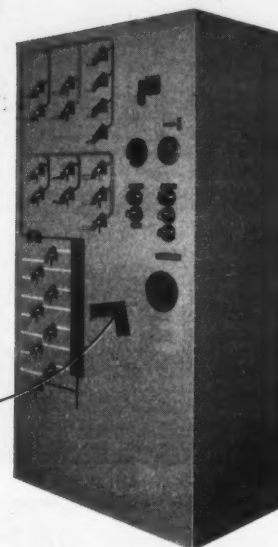
Longer straight section on fittings makes installation easier and minimizes welding

CONTROLLED VOLUME PUMPS ARE FLOW-CONTROL INSTRUMENTS



Typical "aiROYmetric" Controlled Volume Pump. Air-powered pumps have a capacity range of from .04 to 405 gallons per hour against pressures up to 25,000 pounds per square inch. Capacity can be varied manually or automatically.

This Milton Roy graphic panel provides centralized control and monitoring of 23 air-powered Controlled Volume Pumps to regulate a continuous polymerization process.



MILTON ROY GRAPHIC PANEL CONTROLS CONTINUOUS PROCESS

Flow controllers, ratio controllers and final control elements . . . these are the functions performed by 23 Controlled Volume Pumps in automatically controlling a continuous process.

This graphic panel—installed after full study and pilot plant testing—provides centralized control and monitoring of all 23 Controlled Volume Pumps used in the process. Some of these pumps control the flows and maintain the ratios of process streams. Others are used as final control elements, controlling the flow of catalyst in response to process demand, as dictated by the reactor temperature controller.

Milton Roy Controlled Volume Pumps are flow-control instruments that can solve your flow-control problems. Our Engineering Services include detailed recommendations on pumps, process instrumentation, accessories, panel design and construction.

Reference Literature: Write for Application Engineering Data Sheet A-54-2 "Instrumentation of a Continuous Reactor" and Bulletin 1053 "Air-Powered Controlled Volume Pumps."

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COMPANY**

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1354 E. MERMAID LANE • PHILA. 18, PA.

CONTROLLED VOLUME PUMPS AND AUTOMATIC CHEMICAL FEED SYSTEMS

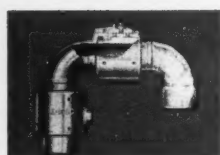
Engineering representatives in the
United States, Canada, Mexico, Europe,
Asia, South America and Africa.

When inquiring check CP 3785 on handy form, pgs. 2-3

FINEST SWIVEL FITTING ON THE MARKET TODAY



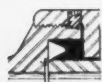
**out-performs on every job —
yet costs no more**



STYLE 5 U.S. TYPE



Grooved packing for high temperatures or corrosive services.



Lip type packing for high pressures.

Throughout the world, you'll find EMSCO Ball Bearing Swivel Fittings on vital installations where safety, free-turning and low resistance to flow are essential.

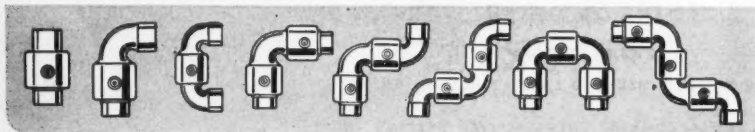
Compare EMSCO ball race design — thrust bearings for thrust loads. Compare the method of sealing against leakage — an isolated packing chamber in which is retained the type of packing most suited to the job. Fitting breaks like a union for easy inspection or replacement of packing.

You profit directly from these features — the result of years of engineering know-how built into every EMSCO fitting. If you're not already using EMSCO, better send today for latest catalog and prices.

EMSCO MANUFACTURING COMPANY

Box 2098, Terminal Annex

Houston, Texas LOS ANGELES 54, CALIF. Garland, Texas



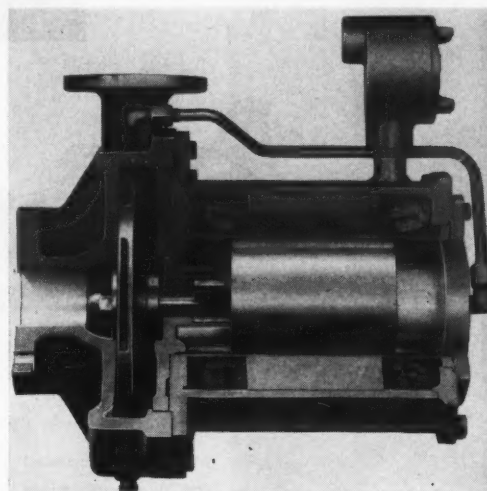
When inquiring check CP 3786 on handy form, pgs. 2-3

ENGINEERING & MAINTENANCE

**O-rings eliminated from pump
— It remains leak-proof**

Uses: Pumping hard-to-handle fluids such as hot sulfite liquor, hydrocyanic acid, and molten sulfur.

Features: Even though O-ring seals, used in earlier models, have been completely eliminated, pump provides leak-proof service.



Pump handles corrosive fluids

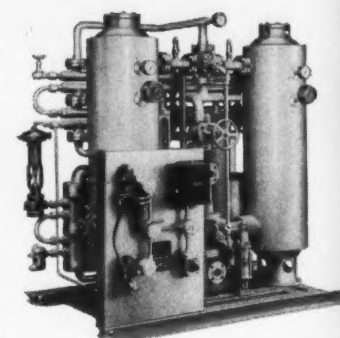
Description: Sealless centrifugal pump has welded construction that allows field dismantling and reassembly with no loss in leak-proof qualities.

(Sealless centrifugal pump is a product of Station R, Chempump Corporation, Dept. CP, 1300 East Mermaid Lane, Philadelphia, Pa. . . or for more information check CP 3787 on handy form, pages 2 and 3.)

Corrosion featured in December

Titanium, tantalum, zirconium, alloys, aluminum, inhibitors, protective coatings, cathodic protection, and corrosion-resistant equipment will be among subjects covered in the Corrosion Control feature appearing in December CP. For the latest developments on these topics and others — see this issue.

Regular Corrosion Control section will be expanded in this issue to include topics that will be of particular interest to those engaged in solving corrosion problems. Although other sections will appear as always, we will highlight Corrosion Control in December in response to the wide interest readers have shown in this subject.



IT ELIMINATES MOISTURE PROBLEMS

This dependable Pritchard dehydration unit—a packaged dryer proved efficient in all types of industrial, processing and laboratory installations —reduces moisture content of air or other gases to desired dew points. That eliminates a lot of your moisture problems... gives you a good reason for owning a HYDRYER*. There are other good reasons, all of which will save you money.

Here are examples: A HYDRYER will eliminate costly plant and equipment shutdowns due to moisture and ice; it will protect precision instruments and controls; it will reduce corrosion, line losses, flow stoppages.

*Registered Trade Name

To find out all about HYDRYERS... and the many ways they can benefit you... write for your copy of Pritchard's new HYDRYER bulletin, No. 16.0.081.



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A DIVISION OF J. F. PRITCHARD & CO.

Dept. 343 210 West 10th Street
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Representatives in Principal
Cities From Coast to Coast

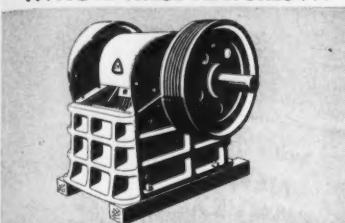
COOLING TOWERS • SPECIALIZED HEAT
EXCHANGERS • GAS & AIR TREATING EQUIPMENT

When inquiring check CP 3788
on handy form, pgs. 2-3

CHEMICAL PROCESSING

DENVER EQUIPMENT

...NOTE THESE FEATURES...

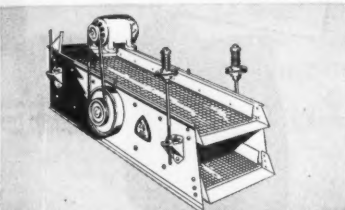


DENVER JAW CRUSHER

Size: 5' x 6" to 32' x 40".

Features: Steel Frame, anti-friction bearings, Manganese steel liners.

| | | |
|-----------------|-----------|-----------|
| Price examples, | 5' x 6" | \$ 581.00 |
| less drives. | 8' x 10" | 1375.00 |
| FOB Denver. | 10' x 16" | 2211.00 |

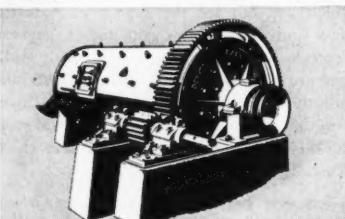


DENVER-DILLON VIBRATING SCREEN

Size: 1' x 3', to 6' x 14'; 1, 2, 3 or 4 decks.

Features: 2 bearing drive, low H.P., all steel construction.

| | | |
|-----------------------|---------|-----------|
| Price examples, | 2' x 4' | \$ 600.00 |
| less drive and screen | 3' x 6' | 1155.00 |
| cloth, Double Deck. | 4' x 8' | 1870.00 |
| FOB Denver. | | |



DENVER STEEL HEAD BALL MILL

Size: 30" x 18" to 6' x 24".

Features: Cast steel heads, cut tooth gears, protected trunnion bearings and manganese steel liners.

| | | |
|-------------------------|-----------|-----------|
| Price examples, | 30" x 36" | \$1195.00 |
| with liners, less drive | 4' x 4' | 5156.00 |
| and ball charge. | 5' x 6' | 7986.00 |
| FOB Denver. | | |



DENVER EQUIPMENT COMPANY

"The firm that makes its friends happier, healthier and wealthier"

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1400 Seventeenth St.
Phone Cherry 4466

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1123-24 Bell Bldg.
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4114 Empire State Bldg.
Phone Chickering 4-6510

Toronto 1, Canada
220 Bay Street
Phone Empire 3-8836

El Paso, Salt Lake City, Mexico, D.F.,
Vancouver, London, Johannesburg.
Technical Bulletins on Request.

When inquiring check CP 3789
on handy form, pgs. 2-3

NOVEMBER, 1954

ENGINEERING & MAINTENANCE

**Hot water under high pressure
gets rid of dirt fast
on toughest jobs...**

mobile steam generator supplies 180°F water
at 1200 gph and 240 psi

Uses: Heavy-duty cleaning jobs in industry where a large volume of hot water under pressure is needed to remove dirt and other difficult materials, and to decontaminate, deodorize equipment and buildings.

Features: Mobile cleaning unit is designed to do an effective job in three ways: by jetting out 1200 gph of 180°F water under pressure of 240 psi, by mixing hot jet with a detergent, or by steam cleaning with or without detergent.

Description: Hot water cleaning unit, called the Hydro/Steam Model 4989-G, incorporates an automatic 40 hp steam generator. This generator develops 120 psi working steam pressure in two minutes from cold water. It supplies over 1100 lb of steam an hour which is directed through a Sellers Injector where steam heats cleaning water and pressure is increased by venturi in the injector.

Automatic controls on steam generator cause machine to form steam only when cleaning gun is turned on. However, unit automatically cycles on and off to hold working steam pressure. Pressures can be changed from 75 to 290 psi by adjusting one control.

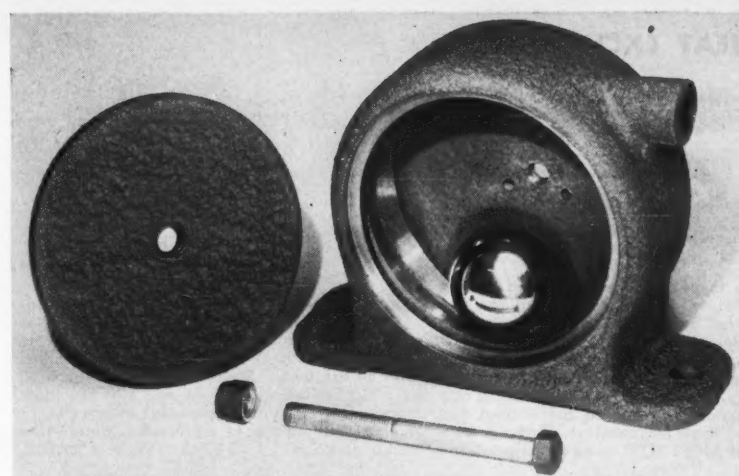


Detergent may be included in high-pressure stream

A 4.5 hp gasoline engine drives generator's feed water pump, blower, fuel pump, and magneto... or a 2 hp electric motor can be used. Hot gases from draft fuel-oil fire in unit wipe over steel coils turning water pumped through to steam. Nine gallons of fuel oil per hour are consumed when unit is running steadily.

Cleaning unit is mounted on a two-wheel trailer and enclosed in a metal cabinet. Fuel tanks for eight hours of operation and a float control water supply tank are incorporated in cabinet. High-pressure steam hoses and cleaning gun are included.

(Hot water cleaning unit is a product of Vapor Heating Corp., Dept. CP, 6420 W. Howard St., Chicago 31, Ill. . . . or for more information about manufacturer's product reader may simply check CP 3790 on the convenient Reader Service slip which is located between pages two and three.)



**new airoviber moves bulk
materials, quickly, quietly,
and effectively...**

**AiroViber simple design provides
dependable, trouble-free vibration**

This new method of external vibration can be used to good advantage in loading, unloading, moving, packaging, processing, grading or separating bulk materials.

The AiroViber is able to deliver effective and dependable vibration with only one moving part, a heavy steel ball running on a circular track. The pounding usually associated with the ordinary types of vibration has been eliminated with the special noise lessening design, exclusive with AiroViber.

Simplified Design: AiroViber's one moving part is a steel ball. An air jet blows it at high speed around a ground and hardened steel track in the housing. The weight of the ball develops a strong centrifugal force, which the vibrator transmits through its mounting into the object to be vibrated. It will start and operate under any condition and performs at high or low temperatures. AiroViber is not affected by humidity.

Trouble-Free Operation: The AiroViber is almost fool proof in operation. Because it has no close fitting parts to lubricate or adjust, it will start every time you open the air valve. You can install it in hard to get at locations with full confidence

that it will operate without lubrication or maintenance for a long time.

No Installation Problems: AiroViber is easy to install. It does not need any special line oilers or air filters. Merely hook up an air hose large enough to deliver the air specified for the unit you select.



AiroViber rotary vibration breaks up arching and jamming in bins, hoppers, chutes, feeders, and other places where bulk materials hang up. It is also recommended for vibrating tables or platforms, sorting and many other applications.

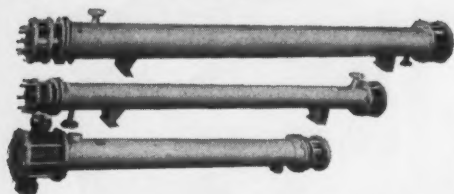
AiroViber is a product of the Viber Company, leader in the field of vibration. For further information, write: Viber Company, 726 South Flower St., Burbank, Calif. CP69



CONCRETE VIBRATORS SINCE 1931

When inquiring check CP 3791 on handy form, pgs. 2-3

HEAT EXCHANGERS

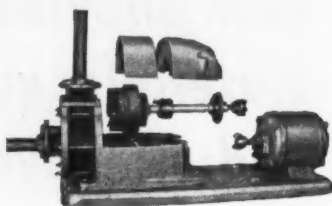


Falls Industries meets all heat exchanger requirements! Standardized IMPERVITE (impervious graphite) single and multi-pass tube and shell units are available for quick delivery in sizes from 7 to 241 tubes. Larger IMPERVITE exchangers available on order. Tubes used

in these units are extruded by a specially developed method which almost completely eliminates laminations. Resulting IMPERVITE tubing gives maximum uniform heat transfer and is free from spalling at the high temperature limit of 325-340°F. Tubes are spaced on full 1 1/2" centers which reduces fouling and increases ease of cleaning and maintenance. Standard exchangers utilize IMPERVITE bundles housed in steel shells, however shells can be fabricated from IMPERVITE, Stainless, Cu, Al, etc., or can be lined. In addition, Falls Industries designs and manufactures custom engineered metal heat exchangers from all types of special alloys . . . or for high temperature work up to 700°F, exchangers can be made of impermeable GRAPH-I-TITE, a new carbon-impregnated graphite . . . CATALOGS AVAILABLE.

CENTRIFUGAL PUMPS

Improved IMPERVITE centrifugal pumps feature a new, virtually leak-proof, high-density-carbon seal, developed and produced by Falls Industries. Pumps utilize oversized bearings and heavy-duty stainless shaft. Shaft and impeller are made as two separate and independent components for quicker, more economical maintenance. All rotating parts are precision balanced. IMPERVITE centrifugal pumps give longer, trouble-free service, especially under severe operating conditions. WRITE FOR NEW CATALOG.



RUPTURE DISKS

Capable of withstanding temperatures to 325°F., IMPERVITE rupture disks are machined to precision tolerance from monolithic pieces of chemically impervious graphite bar stock. Disks will fit any standard 150# flange, are available from 2" to 12" diameters for pressures from full vacuum to 250 psi. IMPERVITE rupture disks feature practically 100% breakout of pressure membrane to allow maximum full opening for safe escape of excess pressures. Sizes larger than 12" furnished on special order. Data sheet available giving detailed burst ranges, installation information, etc.



TOWERS CASCADE COOLERS PIPE AND FITTINGS VALVES

Check the advantages of IMPERVITE processing equipment . . . less maintenance less operating cost . . . longer life. Get the latest catalogs and information about this complete line of outstanding processing equipment . . . Check the coupon below and mail it today!

FALLS INDUSTRIES INC. • SOLON, OHIO

SEND ME ADDITIONAL DATA

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| <input type="checkbox"/> HEAT EXCHANGERS | <input type="checkbox"/> CASCADE COOLERS |
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| <input type="checkbox"/> TOWERS | <input type="checkbox"/> FIELD SERVICE |
| <input type="checkbox"/> OTHER | |

Falls Industries Inc.

AURORA ROAD,
SOLON, OHIO

ENGINEERING & MAINTENANCE

Material handling pumps actuated by air

Air-operated material handling pumps designed specifically for materials that are to be sprayed or flowed are described and illustrated in 12-page bulletin. Extra-heavy materials and even abrasives can be handled by units described.

Bul 700 is issued by Binks Mfg. Co., Dept. CP, 3114-40 Carroll Ave., Chicago 12, Ill. When inquiring specify CP 3793, pages 2 and 3.

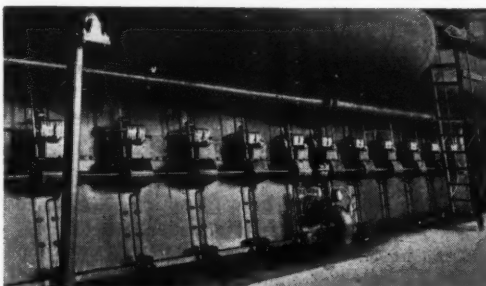
Human element is eliminated from lubrication control on huge engines . . .

force-feed lubricators plus constant-level supply tank give more dependability

At the Coya Sur power plant of Anglo-Lautaro Nitrate Corp. near Tocopilla, Chile, a recent installation was made of two 29" bore, 12-cylinder diesel engines. One of the interesting operating ideas incorporated in the installation is a series of force-feed lubricators, with seven separate pumps and feeds for each cylinder, which supply lubricating oil to the cylinder liners of the engines.

Reservoirs of these lubricators would normally be filled by an attendant while making routine inspections. However, since plant is designed to operate with only the switchboard operator and an assistant, a system for maintaining a constant level in the lubricator reservoirs was developed. This allows assistant switchboard operator to make only one trip per shift around lubricators to see that they are functioning properly. It also assures more dependable lubrication of cylinders by eliminating human element from important task of filling these reservoirs.

For this system a lube oil storage tank was placed in the basement with remote level indication on control desk (switchboard). From this tank, lube oil is pumped in a closed circuit to a small tank mounted on the wall behind each engine. Level in wall-mounted tank is on level with that of lubricator reservoirs.



Each lubricator unit serves one cylinder of engine

Check the
Liquid Level
From Anywhere
in the
Room

with the
**NEW
CONVEX
SCALE**
Jerguson
TRUSCALE
Remote Reading
Gage



Available with
Explosion Proof
illumination.

Compensated Mono-
metric Gage meets
new interpretation
of the boiler code
for WSP of 900 psi
or higher.

You get full 180° visibility . . . so you can read the liquid level from any point from which you can see the gage . . . with the New Convex Scale now available on Jerguson Truscale Remote Reading Gages. Scale markings are directly on the convex face and the indicator goes clear around the convex surface. You can stand at one end of the control room and instantly check your whole line up of Truscale Gages.

Jerguson Truscales give you instant remote readings of liquid levels of waste heat boilers, tanks, etc. . . with the amazing accuracy of 1/2 of 1% of scale reading. And with the New Convex Scale you make these readings from any angle . . . accurately, without distortion. Truscales also available with lights, horns and Truscale Repeaters.

Write today for complete data on
Truscale Gages with the New Con-
vex Scale.

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Gages and Valves for the
Observation of Liquids and Levels

JERGUSON GAGE & VALVE COMPANY
100 Fellsway, Somerville 45, Mass.

Offices in Major Cities
Bailey Meters & Controls, Ltd., London, Eng.
Contrôle Bailey, Paris, France

When inquiring check CP 3794
on handy form, pgs. 2-3

CHEMICAL PROCESSING

When inquiring check CP 3792 on handy form, pgs. 2-3

A header connecting all lubricators on one engine with constant-level tank passes beneath floor and has risers to each lubricator. In each riser is placed a short section of neoprene rubber hose, which can be pinched shut to test oil consumption and distribution of lubricators. Rubber hose is used instead of valves because of possibility of leaving valve closed. Rubber hose system employs one pinch clamp which must be returned to switchboard when operator has finished testing lubricators.

Entire engine installation was made by engineers and diesel plant operators of the Coya Sur plant in collaboration with Nordberg Mfg. Co., which supplied engines. This plant is part of a three plant network, all within a radius of ten miles, whose combined power generating facilities amount to a capacity of 46,000 kilowatts.

(Force-feed lubricators are products of Manzel Div., Frontier Industries, Inc., Dept. CP, 244 Babcock St., Buffalo 10, N.Y. . . . or for more information check CP 3795 on handy form, pages 2 and 3.)

Rust inhibitor, heat retaining agent increase thawing effectiveness of ice-removing chemical

Addition of a combination rust inhibitor and heat-retaining agent to ice-removing chemical granules has increased thawing effectiveness of chemical. Material, called X-73, is applied by scattering lightly over icy surfaces and is said to possess 30 times thawing capacity of salt. Use of chemical reduces winter cost of cleaning steps, walks, drives, loading docks, and parking lots. Rust inhibitor included prevents harmful chemical-water action on metal.

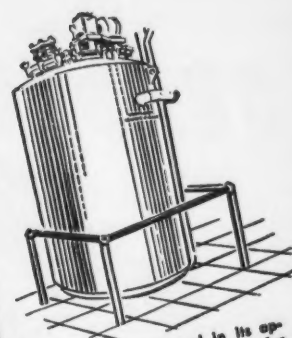
Ice-removing chemical is packed in 100, 200, and 300 lb fiber drums. Ton lots are shipped in 100 lb waterproof bags.

(Ice-removing chemical is a product of The Monroe Company, Inc., Dept. CP, 10703 Quebec Ave., Cleveland 6, Ohio . . . or for more information check CP 3796 on handy form, pages 2 and 3.)

Details uses of insulation on low-pressure lines

Uses of low-pressure insulation on cold and hot water and low-pressure steam lines are detailed in four-page data book. Also included is a graphic representation of thermal performance under various temperatures.

Data book on Fiberglas low-pressure pipe insulation is issued by Owens-Corning Fiberglas Corp., Dept. CP, 1833 Nichols Bldg. Toledo 1, Ohio. Specify CP 3797, pages 2 and 3.



Worm gearing—universal in its application—affords advantages for almost every power transmission job. The Cleveland VD unit atop this 275 gallon tank drives a stainless steel agitator which mixes Insulin (Insulin-Lilly) for Eli Lilly and Company, Indianapolis, Indiana.

CLEVELAND whips problem of uniform solutions

INSULIN solution to the tune of 275 gallons per batch agitator is mixed in this jacketed stainless steel tank. The —a worm gear unit whose steady performance helps to insure uniformity in the dilutions processed.

For forty years, Clevelands have mixed in the best companies, in the chemical and allied industries. In fact, wherever the need for a dependable vertical or horizontal right-angle drive arises, there you'll likely find Clevelands at work, operating dryers and kilns, screw conveyors, bucket elevators, mixers and agitators, as well as other industrial equipment.

For full information to help solve your own power transmission problems, send now for new Catalog 400. The Cleveland Worm and Gear Company, 3257 East 80th Street, Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Ltd.

CLEVELAND

Worm Gear

Speed Reducers



When inquiring check CP 3798 on handy form, pgs. 2-3



FLEXIBLE STANDARDS for Pfaudler

Stainless Steel Heat Exchangers

Design features previously associated only with custom-built heat exchangers are now available at competitive standard cost under Pfaudler's new system of flexible standards.

For a given heat transfer area, you may select the most applicable combination of length and diameter. Further, nozzles can be of any size and in any position and can be either threaded or flanged.

RAPID DELIVERY — With our new production line methods, flexible standard units can be delivered in 4 to 8 weeks after receipt of your order.

COMPLETE LINE — The flexible standard program applies to fixed tube sheet, single or multi-pass, tube and/or shell side stainless steel units in diameters up to 10". In addition, Pfaudler heat exchangers are available with shell diameters from 4" to 24" in four basic types of construction . . . fixed tube sheet condenser, outside packed floating head design with removable tube bundle and shell, "U" tube construction with removable bundle.



GET THIS PFAUDLER DATA BOOK — This 40-page fact-packed heat exchanger manual contains all the data you need to work out capacity and type problems. Easy-to-follow tables, curves and charts. Full details on Pfaudler heat exchangers. Mail the coupon for your copy.

Pfaudler

**ENGINEERS AND FABRICATORS OF CORROSION RESISTANT
PROCESS EQUIPMENT**

GLASSED STEEL—Hastelloy • Aluminum • Tantalum • Teflon
Carbon Steel • Solid or Clad Stainless Steel • Nickel • Inconel • Monel

THE PFAUDLER CO., Dept. CP-11, Rochester 3, N. Y.

Please send me the Pfaudler Heat Exchanger Manual No. 837

Name

Title

Company

Address

City Zone State

When inquiring check CP 3799 on handy form, pgs. 2-3

new literature

Gives engineering data on ductile cast iron

Data on machinability, gall resistance, compressive strength, and other mechanical properties of ductile cast iron are included in eight-page, illustrated bulletin. Examples are given on appropriate use.

Bul DI-2 is available from The International Nickel Company, Inc., Dept. CP, 67 Wall St., New York 5, N.Y. When inquiring specify CP 3800 on handy form, pages 2 and 3.

Explains flow control system for paper stock blending

Illustrated bulletin (4 pages) explains flow metering equipment suitable for paper and pulp mills. Diagrams aid text in explaining paper stock flow control systems.

Bul 90-130-13 is available from Fischer & Porter Co., Dept. CP, 400 County Line Rd., Hatboro, Pa. When inquiring specify 3800A, pages 2 and 3.

High rate of exchange results from resin's porous structure

Characteristics and operating data of a moderately priced polystyrene cation exchange resin are presented in eight-page leaflet. Resin has capacity intermediate between high capacity polystyrene cation resin and other base exchange products. Porous structure allows rapid diffusion of ions resulting in high rate of exchange.

Graphs show capacity performance at various amounts of hardness in presence of varying amounts of sodium salts, capacity as function of regeneration rate, and other properties. Resin can be used under same conditions as other polystyrene cation resins.

Leaflet 32 is issued by Chemical Process Company, Dept. CP, 901 Spring Street, Redwood City, California. When inquiring specify CP 3801 on handy form, pages 2 and 3.

Industrial bulletins pertinent to the reader . . . offering data on products, processes, services

Noble metal thermoelements featured in bulletin

Technical and application data on noble and base metal thermoelements are included in 6-page bulletin. Heat- and corrosion-resistant porcelain insulators and protection tubes are also discussed.

While high temperature measurements in excess of 2200°F made with thermocouples necessitate use of a noble metal thermoelement, bulletin points out the possible application, for purposes of greater accuracy, of such an element in lower temperature range.

"Thermoelements Noble and Base Metals" is issued by Charles Engelhard, Inc., Dept. CP, 850 Passaic Avenue, East Newark, N. J. When inquiring specify CP 3802 on handy form, pages 2 and 3.

Non-foaming valve featured on filling machine

Applications, operation, and features of a rotary, gravity-type liquid filling machine are presented in four-page bulletin. Units described have non-foaming valves, have maximum fill of 50 fl oz.

Bulletin on Dura-Mil liquid filling machine is issued by Turbo Machine Co., Dept. CP, W. Main and Valley Forge Rd., Lansdale, Pa. When inquiring specify CP 3803, pages 2 and 3.

Tetrahydro phthalic anhydride properties and reactions

Of particular value to producers of plasticizers, rubber, resins, adhesives, and pesticides is tetrahydro phthalic anhydride. Four-page bulletin gives properties and important chemical reactions of this compound, as well as seven literature references.

Bul I-1 is issued by National Aniline Div., Allied Chemical & Dye Corp., Dept. CP, 40 Rector St., New York 6, N.Y. When inquiring specify CP 3804 on handy form, pages 2 and 3.

Filter press catalog doubles as reference manual

Written more as a text and reference manual than a filter press catalog, 42-page book is source of current information about industrial filtration equipment and methods. Classified sections devote full discussions on nomenclature and advantages of plate filter press; comparison of flush plates and frames versus recessed plates; construction features of plates; specifications of various models; filterable materials and filter bases; and terminology and step-by-step digest of entire filtration operation—from clothing, closing, filling, washing, and opening.

"Sperry Filter Presses" is issued by D. R. Sperry and Company, Dept. CP, Batavia, Illinois. When inquiring specify CP 3805 on handy form, pages 2 and 3.

Monomeric, polymeric plasticizers described and appraised

Specifications and descriptions of company's line of monomeric and polymeric plasticizers for vinyl, rubber, and nitrocellulose are give in 32-page booklet. Performance data, including an appraisal of the factors of low-temperature flexibility, volatility, water extraction, oil extraction, and heat and light stability are included.

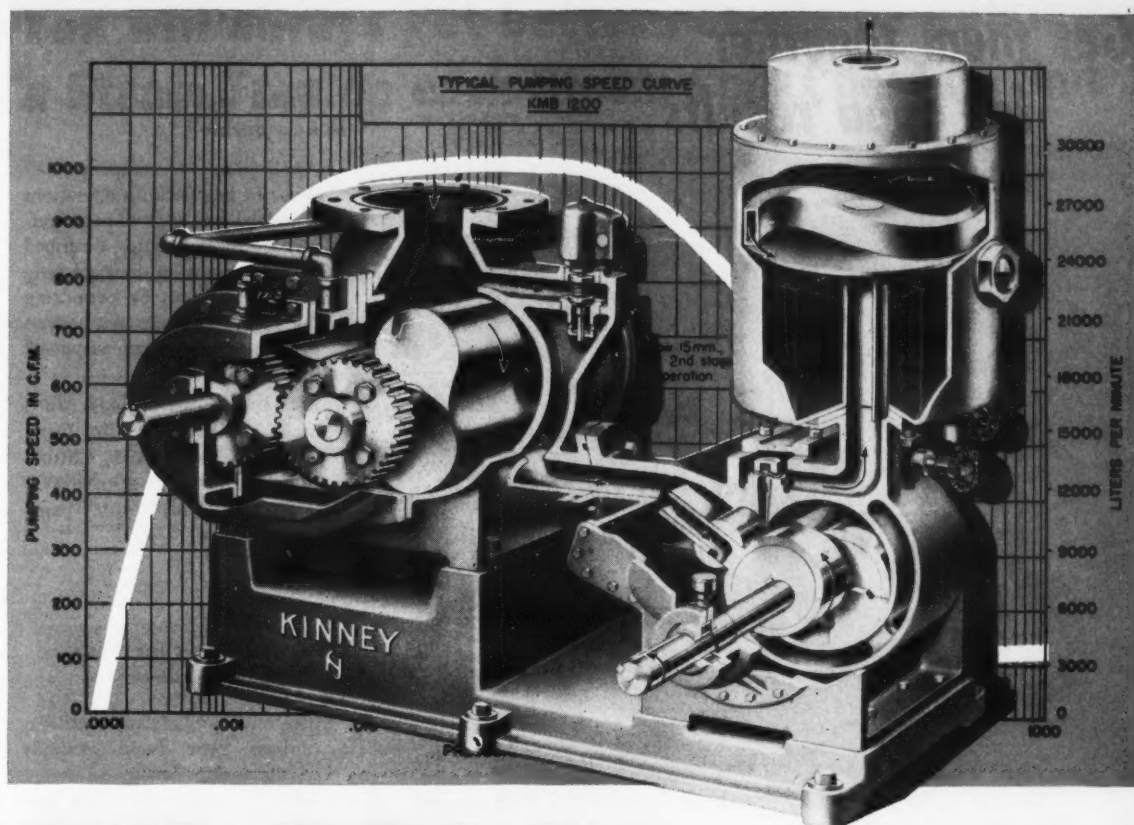
"Plastolein Plasticizers" is issued by Dept. 5, Emery Industries, Dept. CP, Carew Tower, Cincinnati 2, Ohio. When inquiring specify CP 3806 on handy form, pages 2 and 3.

Tells how to boost water well production

How to restore production in old water wells by removing accumulated scale deposits and by enlarging channels in the water-bearing formation is explained in four-page illustrated folder. Treatment includes addition of inhibited hydrochloric acid which removes carbonates, sulfides, and other deposits that reduce flow.

Case histories are included illustrating what has been done in specific applications. Treatment also helps bring new wells to maximum level of water production.

"Acidizing Service for Water Wells" is issued by Dowell Incorporated, Dept. CP, P. O. Box 536, Tulsa 1, Okla. When inquiring specify CP 3807 on handy form, pages 2 and 3.



BIG BOOST IN VACUUM PROCESSING SPEED

The new Kinney Model KMB Mechanical Booster Vacuum Pump produces four times more vacuum pumping speed per pump horsepower than any previously developed mechanical vacuum pump. This efficient pump works fast and clean . . . there is no liquid sealant in the main rotor unit to backstream into the vacuum system and contaminate the process. Kinney Model KMB has no stalling pressure — handles sudden outbursts of gas in its stride — saves valuable processing time by eliminating work spoilage and equipment downtime.

Kinney Model KMB is one of thirteen Kinney High Vacuum Pump Models — the big line of industry-proved vacuum pumps. Kinney district offices are staffed with competent vacuum engineers, ready to help you get the right pump for your needs. Send coupon for details.



KINNEY MFG. DIVISION

THE NEW YORK AIR BRAKE COMPANY

3573 WASHINGTON STREET • BOSTON 30 • MASS.



☐ Please send Bulletin V54 describing the complete line of Kinney Vacuum Pumps.

☐ Our vacuum problem involves _____

Name _____

Company _____

Address _____

City _____ State _____

When inquiring check CP 3808 on handy form, pgs. 2-3

**Get them together
for good results...**



You can bond practically anything to anything with specialized Flintkote adhesives.

And these products will likely save you time and money in bonding or fastening!

In production operations such as cementing, laminating and impregnating a wide variety of materials, lower costs are often possible with Flintkote Industrial Adhesives. Select from asphalts, latex compounds, rubber dispersions or rubber-resin solvent cements.

What's *your* problem? Processing, compounding, sealing, bonding, saturating, sizing... cutting costs?

Investigate Flintkote's extensive line of both aqueous and solvent types of compounds... natural and synthetic bases... from drums to carloads. Our technical staff will be glad to work out application procedures with you.

Over 50 Years' Specialized Experience At Your Service... by 'phone, mail or personal call. No obligation.



FLINTKOTE
Products for Industry



THE FLINTKOTE COMPANY, Industrial Products Division,
30 Rockefeller Plaza, New York 20, N. Y.; 55th &
Alameda Sts., Los Angeles 54, Calif.

The Flintkote Co. of Canada, Ltd. — Toronto, Ontario

When inquiring check CP 3809 on handy form, pgs. 2-3

NEW LITERATURE

Tells cost reduction in bag packing

Application of company's Y-veyor in bag packing operations is explained in two-page reference sheet. Setup described effects savings in unit packing and sewing costs by permitting one man to operate two packers and one man to sew output of both units.

Reference Sheet 53G is issued by Richardson Scale Co., Dept. CP, Van Houten Ave., Clifton, N.J. When inquiring specify CP 3810 on handy form, pages 2 and 3.

Gives four basic methods of density measurement

Illustrated, four-page bulletin explains four basic methods of measuring density in paper and pulp mills. Four illustrations aid text in presenting following methods: buoyance of submerged float, hydrometer of floating buoy, air bubbler dip tubes, and liquid purged pressure difference.

Bul 90-130-11 is issued by Fischer & Porter Co., Dept. CP, 400 County Line Rd., Hatboro, Pa. When inquiring specify CP 3811 on handy form, pages 2 and 3.

Gives specifications on gas analyzers

Illustrated four-page bulletin gives specifications and applications of gas analyzer with a sensitivity of five parts per billion. Detector's method of analysis involves detection of mercury vapor in ultraviolet light. Unit may be used on approximately 22 gases.

Bul 501 is issued by Taller & Cooper, Inc., Dept. CP, 75 Front St., Brooklyn 1, N. Y. When inquiring reader may simply specify CP 3812 on handy form, pages 2 and 3.



PROTECT EQUIPMENT
against abnormal
pressure increases with
Edward
RELIEF VALVES

Edward relief valves protect equipment against sudden and unusual pressure increases in piping systems. Foolproof design and accurate spring action make them absolutely dependable. One low cost valve can save much expensive equipment.

Used extensively in power, chemical, process, petroleum, hydraulic, marine, and general industrial service, they are particularly suited for relieving pressure in pump lines, drums, heat exchangers, and unfired pressure vessels handling water, steam, oil, or vapor.

They need no packing, maintenance is negligible, and the fine pitch threads of the adjusting screw allow close regulation of pressure setting.

NEW BULLETIN Write for new free bulletin No. 711 containing latest design details, dimensions, weights, and installation information.

Another  Product
Edward Valves, Inc.
Subsidiary of ROCKWELL MANUFACTURING COMPANY

1230 West 144th Street, EAST CHICAGO, INDIANA

When inquiring check CP 3813 on handy form, pgs. 2-3

NO DOWNTIME
in over a year using
a **PLATECOIL** in
REPLACES PIPE COIL
a parkerizing tank

The only time this Platecoil was removed in over a year was to take its picture. The single 22" x 23" Platecoil has heated a 100-gallon Parkerizing tank, in daily use, *without downtime* at the Lycoming Spencer Division of Avco Corp. Built of Electro-Polished Stainless Steel, the Platecoil has required no cleaning or repairs. Platecoils will replace pipe coils at a savings in any heat transfer application.



Send for complete
technical manual and
descriptive Bulletin No. P54

When inquiring check CP 3814 on handy form, pgs. 2-3

PLATECOIL
Division
Tranter Mfg. Inc.
LANSING 4, MICHIGAN

CHEMICAL PROCESSING

NEW LITERATURE

Story of laminated plastic colorfully told

Laminated plastic produced by combining thermo-setting resins — phenol, melamine, or silicone — with a wide range of base materials, such as paper, cotton or nylon cloth, asbestos paper and fabric, or glass cloth, is colorfully described in 12-page pocket-size brochure. Booklet pictorially portrays "Champ" Phenolite battling "Ogre Oscar," who typifies production line headaches and low product quality.

"Champ" Phenolite is issued by National Vulcanized Fibre Co., Dept. CP, Wilmington 99, Del. Specify CP 3815, pages 2 and 3.

X-ray analysis charts shown for Illium, Samarskite

Folders show actual charts made on X-ray analysis instrument for Illium, Samarskite, $C_{28}H_{56}$, and Albite-microcline. Specimens of Illium and Samarskite were analyzed for elements on X-ray spectrograph. Albite-microcline and $C_{28}H_{56}$ charts were analyzed on X-ray Diffractometer.

Diffractometer and Spectrograph Charts are available from Research & Control Instruments Div., North American Philips Co., Inc., Dept. CP, 750 S. Fulton Ave., Mount Vernon, N. Y. When inquiring specify CP 3816 on handy form, pages 2 and 3.

Adjusting to competitive economy — the human problem

Human relations in a "hard sell" period are discussed in Manufacturing Series 214. Article points out that money saved today through automation will not do much good if changeover results in strikes, misunderstandings, tension, and hostility. Management must use the two sciences, automation and human relations, together and not separately if it wants to meet the challenge presented by pushbutton manufacture.

Other topics included in this series of papers are: Tightening Work Standards and Strengthening Incentives, Increasing Responsibility of the Manufacturing Executive, New Trends in Manufacturing Organization, Integration of Production Supervisors, Coordinated Cooperation, and Anatomy of Industrial Habits.

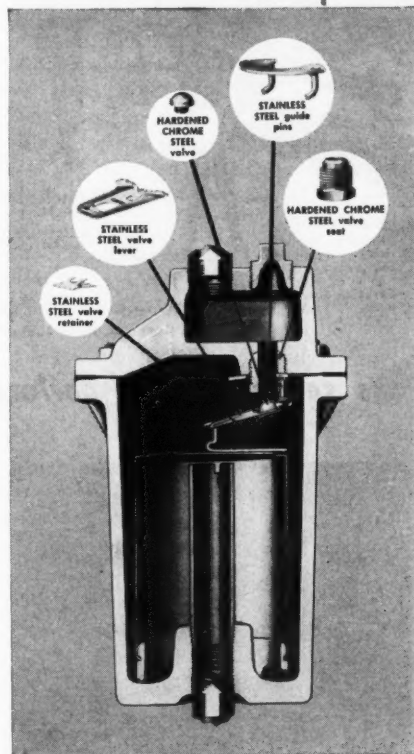
To obtain Manufacturing Series 214 remit \$1.00 (members), or \$1.25 (non-members), direct to American Management Association, Dept. CP, 330 West 42nd Street, New York 36, New York. Specify CP 3817, pages 2 and 3.

You will always get better results by putting a Steam Trap on each Steam Coil, Chest or Unit

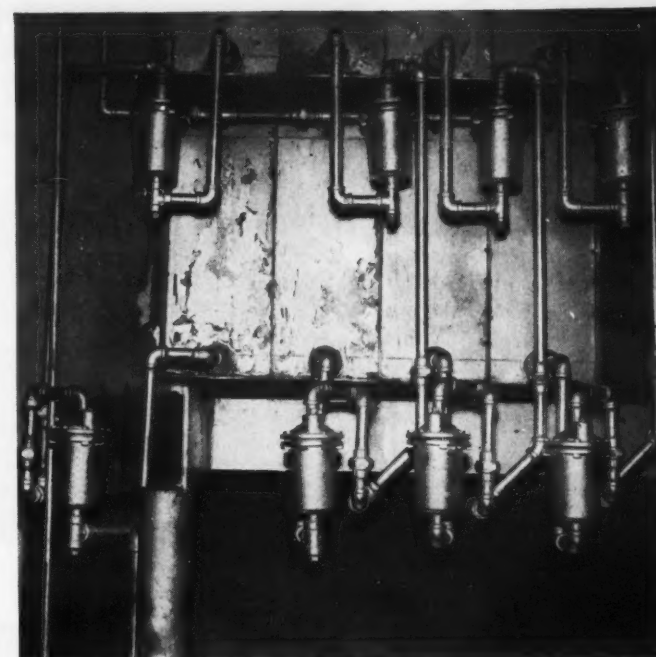
EXAMPLE

Dryer Temperatures at Guelph Creamery, Guelph, Ontario.

| | |
|---|-------|
| WITH GROUP TRAPPING (5 steam traps for 10 coils) | 225°F |
| WITH BLOW-THROUGH (no steam traps) | 250°F |
| WITH ARMSTRONG UNIT TRAPPING (10 traps—one on each of 10 coils) | 309°F |



One of the big advantages of Armstrong traps is **LOW MAINTENANCE**. Mechanisms in low and medium pressure traps identical in design, workmanship and materials to those in 900°F, 900 psig traps.



●The example at the upper left is simply one of thousands that bear out the benefits of "Armstrong Unit Trapping".

When you analyze it, the reason is quite obvious. No two steam coils, chests, chambers or machines will condense steam at exactly the same rate under operating conditions. There is a greater pressure drop in the units that condense the fastest. Steam will backflow through a common drain line from a higher pressure unit to a lower pressure unit. This blocks off flow of air and retards condensate flow from the lower pressure unit. On the other hand, if you separate each unit with its own trap, that can't happen.

You will *always* get higher temperatures and lower production costs with unit trapping. Ask your Armstrong Representative about it, or write:

ARMSTRONG MACHINE WORKS
880 Maple Street, Three Rivers, Michigan

FREE—STEAM TRAP BOOK

If you don't have a copy of the 44-page Armstrong Steam Trap Book, we'll be glad to send you one. No obligation.



ARMSTRONG STEAM TRAPS

When inquiring check CP 3818 on handy form, pgs. 2-3

LOWEST COST PER POUND OF STEAM

STARTS WITH FEATURES LIKE THESE



OPERATING ENGINEER:

"Ease of maintenance at less cost in time and materials — more dependable year-round operation."

INSURANCE INSPECTOR:

"All-welded construction — approved electronic operating and safety devices — meet ASME and Underwriters Laboratories codes."

PLANT SUPERINTENDENT:

"Steam when you need it and in the quantity you require."

CONSULTING ENGINEER:

"Exclusive boiler-burner design gives you highest efficiency even with fluctuating loads, down to 30% of rating."

ARCHITECT:

"Compact, space saving design simplifies boiler room planning for single or multiple units."

OWNER:

"Uses oil or gas fuels which are easier to handle, more efficient and lower in operating cost."

CONTRACTOR:

"Boilers shipped ready to install — can be in operation in as little as 24 hours after delivery."

BOILER INSPECTION ENGINEER:

"A large low-furnace design provides greater safety."

"It's NEW — Get The Facts On The CB Boiler — Write Today"

that's why you profit most from Cleaver-Brooks self-contained boilers

• Top to bottom, inside and out, you get more money-saving features when you specify or buy Cleaver-Brooks self-contained boilers. You make an *investment in quality* that pays off in lowest net cost per pound of steam for processing or heating.

YOU BENEFIT from more than 20 years of experience, working closely with men who have made it their business to be *right* about boilers. You profit from complete coordination throughout planning, installing, supervising and final operation.

YOU BENEFIT from self-contained design and original four-pass construction. These Cleaver-Brooks engineered "firsts," plus forced draft, 5 sq. ft. of heating surface per boiler hp, and exclusive burners, all contribute to highest heat transfer. Guaranteed 80% thermal efficiency when firing with oil is the direct result!

Whether you're planning a new steam plant or modernizing, make certain you get the complete Cleaver-Brooks story before you buy. See your Cleaver-Brooks representative, or write for catalog AD-100. Cleaver-Brooks Company, Dept. M-348, 326 East Keefe Avenue, Milwaukee 12, Wisconsin, U.S.A. Cable Address **CLEBRO** — Milwaukee — All Codes.

Cleaver



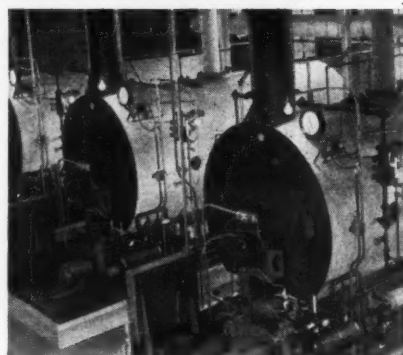
Brooks

ORIGINATORS OF THE

SELF-CONTAINED BOILER

BOILERS... STEAM OR HOT WATER... FOR HEATING OR PROCESSING, IN SIZES FROM 15 TO 500 hp, 15 to 250 PSI.

When inquiring check CP 3819 on handy form, pgs. 2-3



One typical owner can count on yearly savings (\$15,000 fuel and \$10,000 labor) from this battery of three 150 hp Cleaver-Brooks self-contained boilers.

NOW — FIRST SIZES OF THE CB BOILER ARE MADE IN CANADA, TOO.

NEW LITERATURE

Up-to-date data book for engineers

Brought up-to-date and completely revised, pocket-size book presents a compilation of 78 chapters and tables of water conditioning data.

Subjects covered include: hydraulics, impurities in water, chemical conversions, coagulant, acid and alkali dosages, chemicals used in water treatment, and water treatment processes.

Data Book No. 2478A is available to practicing engineers and those who work with water conditioning problems on letterhead request to The Permutit Company, Dept. CP, 330 West 42nd Street, New York 36, N. Y.

Selection of gear drives aided by bulletin

Tables of dimensions, weights, overhung load ratings, and thrust capacity ratings needed to select company's horizontal, vertical, or right-angle gear drives are presented in 28-page bulletin. Foldout section includes information on mounting, low-speed shaft connections, and product features.

Bul 3100-1954 is available from The Falk Corp., Dept. CP, 3001 W. Canal St., Milwaukee 8, Wis. When inquiring specify CP 3820, pages 2 & 3.

Supplemental bibliography on gas turbines

Supplement to National Bureau of Standards circular on gas turbines, jet propulsion, and rocket power plants extends bibliographical data on these subjects through December 1953. A revision of the 1951 circular, the 110-page bibliography lists some 5000 additional references.

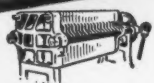
Supplement to NBS Circular 509, "Bibliography of Books and Published Reports on Gas Turbines, Jet Propulsion, and Rocket Power Plants", is available by remitting 50 cents direct to Superintendent of Documents, Government Printing Office, Washington 25, D.C.

Explains loss-in-weight instrument for volumetric dry feeders

Illustrated, two-page bulletin gives dimensional drawing and specifications on loss-in-weight indicator-recorder for volumetric dry feeders.

Bul 50-L13 is issued by Omega Machine Co., Div. of B-I-F Industries, Inc., 345 Harris Ave., Providence 1, R. I. Specify CP 3821, pgs. 2 & 3.

SPERRY



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The right size . . . the right capacity . . .
the right material . . . the right feed.
That's Sperry Plate Filter Presses. As right
for you as profit itself! Each Sperry in-
stallation carries the advantages of low
cost and maximum clarity in a design cus-
tom-engineered for your specific require-
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Write for a free copy of the
brand-new Sperry Catalog. A
complete handbook of facts,
figures, and photos about filtra-
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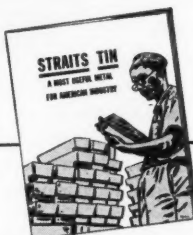
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When inquiring check CP 3822 on handy form, pgs. 2-3



Get This Informative Free Booklet on New Uses for Straits Tin

New, 20-page booklet tells important story of Straits Tin and its many new uses today. Fully illustrated. Includes sections on new tin alloys, new tin solders, new tin chemicals. Covers tin resources and supply, Malayan mining. Booklet is factual, informative—could well prove profitable to you. Mail coupon now.

THE MALAYAN TIN BUREAU

Dept. E, 1028 Connecticut Ave., Washington 6, D.C.

Please send me a copy of your free booklet on new uses for Straits Tin.

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City _____ Zone _____ State _____

When inquiring check CP 3823 on handy form, pgs. 2-3

NOVEMBER, 1954

NEW LITERATURE

Gives facts on tractors and shovel loaders

Illustrated 16-page brochure gives specifications on line of crawler tractors and shovel loaders. Booklet shows equipment in use over wide range of industries.

"FACTS" brochure is issued by Tractor Div., Allis-Chalmers Mfg. Co., Dept. CP, P. O. Box 512, Milwaukee 1, Wis. When inquiring reader may simply specify CP 3824 on handy form, pages 2 and 3.

Catalogs complete line of capillary tubing

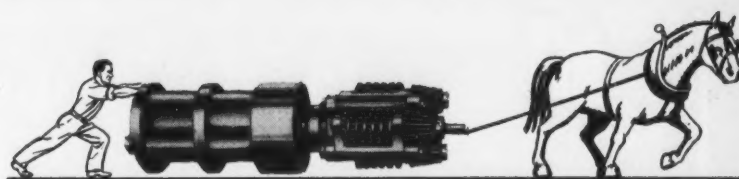
Catalog, illustrated in two colors, lists in tabular form various sizes of precision bore and precision bore capillary tubing. Hair tubing for use in the pharmaceutical and biological fields is listed in a range to 0.4 mm ID and 1.75 mm OD.

Bul 100 is issued by Wilmad Glass Co., Dept. CP, Franklin & Flower Sts., Landisville, N. J. When inquiring reader may simply specify CP 3825 on handy form, pages 2 and 3.

Gives theory, design of stress indicator

Illustrated five-page technical paper explains theory of measuring stress in electrodeposits and describes instrument for this purpose known as the Stresometer. In addition to measuring stress in metallic electrode deposits, instrument also may be used with non-metallic films such as paint, lacquer, and plastics.

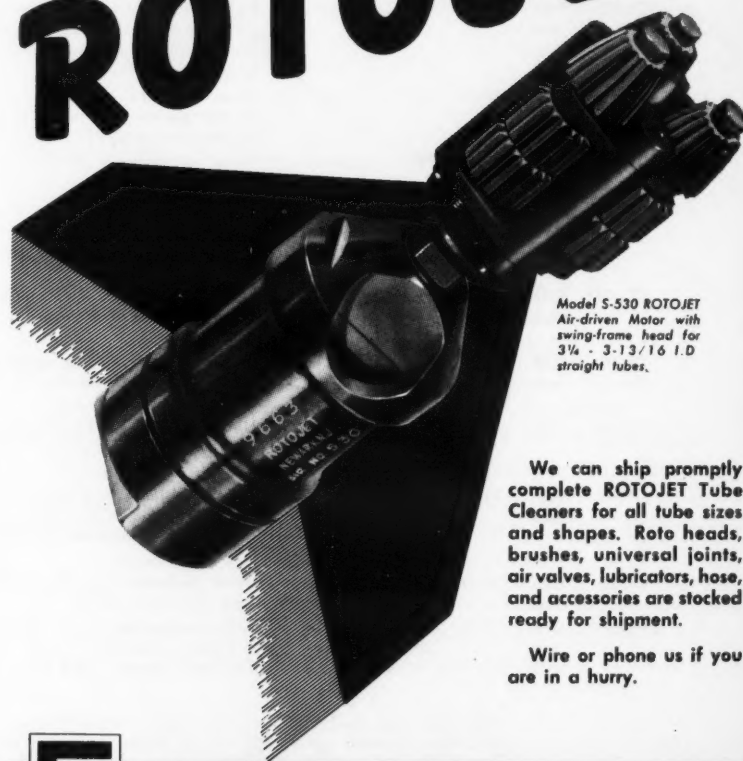
Tech paper on Stresometer is issued by Joseph B. Kushner Electroplating School, Dept. CP, 115 Broad St., Stroudsburg, Pa. When inquiring reader may simply specify CP 3826 on handy form, pages 2 and 3.



Obsolete Tube Cleaners waste time, labor, and money

Even if you rarely use tube cleaners, you can't afford to be without a powerful new ROTOJET. A ROTOJET should save you enough in time, labor, and air in one cleanout to pay for itself. You won't believe a tube cleaner can pack such tremendous power until you try the new ROTOJET.

Get a new ROTOJET®



Model S-530 ROTOJET
Air-driven Motor with
swing-frame head for
3 1/4 - 3-13/16 I.D.
straight tubes.

We can ship promptly
complete ROTOJET Tube
Cleaners for all tube sizes
and shapes. Roto heads,
brushes, universal joints,
air valves, lubricators, hose,
and accessories are stocked
ready for shipment.

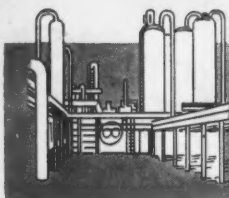
Wire or phone us if you
are in a hurry.



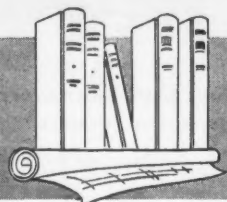
ELLIOTT COMPANY-ROTO DIVISION

141 Sussex Ave., Newark 1, New Jersey

When inquiring check CP 3827 on handy form, pgs. 2-3



Processing and Engineering Data



99

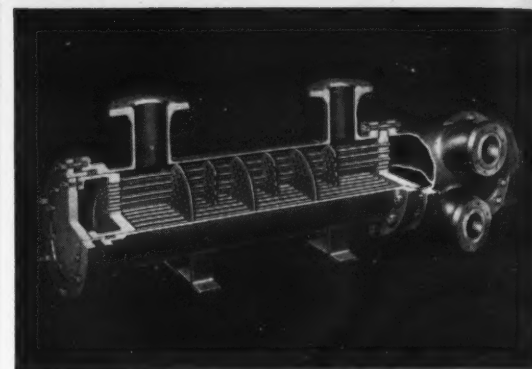
Corrosion Resistant Alloys

Information furnished by
ALLOY CASTING INSTITUTE

Designations for corrosion-resistant alloys have recently been revised. This listing gives properties for principal alloys.

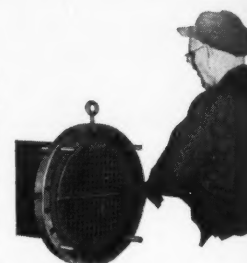
| Type | Composition | | | | Corrosion Resistance | Other Properties |
|--------|---------------|---------------|---------------|----------------------------------|---|--|
| | C | Cr | Ni | Other | | |
| CA-15 | 0.15 max | 11.5- 14.0 | 1.0 max | 0.5 Mo max | Good atmospheric corrosion resistance. Also withstands many organic media in mild service | Hardness range 144 to 400 BHN. Weldable, machinable |
| CA-40 | 0.20- 0.40 | " | " | " | Same as CA-15 alloy | Higher carbon content permits hardening to max of about 500 BHN |
| CB-30 | 0.30 max | 18-22 | 2.0 max | — | Provides excellent resistance to nitric acid, alkaline solutions, and many organic chemicals | Readily machinable, fair ductility, non-hardenable, poor impact strength |
| CC-50 | 0.50 max | 26-30 | 4.0 max | — | Resists dilute sulfuric acid, mixed nitric and sulfuric acids, and oxidizing acids of all types | Can be machined easily, magnetic |
| CE-30 | 0.30 max | 26-30 | 8-11 | — | Particularly resistant to sulfurous acid and sulfites in paper industry, dilute sulfuric with sulfurous, and sulfuric with nitric | Has better strength and ductility than CC-50, useful where castings cannot be heat treated effectively |
| CF-8 | 0.08 max | 18-21 | 8-11 | — | Especially useful in resisting attack by strongly oxidizing media such as boiling nitric acid | Retains high impact strength at temperatures below -400°F. |
| CF-20 | 0.20 max | 18-21 | 8-11 | — | Serves satisfactorily in many types of oxidizing service | High ductility and impact strength, good machining and welding characteristics, non-magnetic |
| CF-8M | 0.08 max | 18-21 | 9-12 | 2.0-3.0 | Good resistance to reducing media, resists pitting corrosion in sea water | Usually employed at operating temperatures below 1000°F, ductile and strong |
| CF-12M | 0.12 max | 18-21 | 9-12 | 2.0-3.0 | Similar to CF-8M, not quite as good corrosion resistance as the former | Preferred for operating temperatures above 1200°F, retains strength under those conditions |
| CF-8C | 0.08 max | 18-21 | 9-12 | 8 x C min 1.0 max Cb | Resists strongly oxidizing media, similar in corrosion resistance to CF-8 | Addition of columbium (or columbium plus tantalum) makes alloy suitable for field welding |
| CF-16F | 0.16 | 18-21 | 9-12 | 0.20-0.35 Se | Not as good as CF-20 type but adequate for many purposes | Addition of selenium improves machinability. Good welding characteristics |
| CH-20 | 0.20 max | 22-26 | 12-15 | — | Better resistance to certain corrosives than CF-8 type, resists intergranular corrosion, used for hot dilute H ₂ SO ₄ | More ductile than CE-30 but not as strong, stronger than CF-8 but not as ductile |
| CK-20 | 0.20 max | 23-27 | 19-22 | — | Good resistance to dilute sulfuric acid | Withstands elevated temperatures |
| CN-7M | 0.07 max | 19-22 | 27.5- 30.5 | 3.0 Cu min 1.75-2.50 Mo | Withstands sulfuric acid and many reducing chemicals, resists dilute HCl, hot chlorides, and nitric acid | Excellent machining and fair welding characteristics, non-magnetic |

(This chart was condensed from data sheets recently published by the Alloy Casting Institute, who represent about 80% of the manufacturers of corrosion-resistant cast alloys. This is the first complete revision of types, designations, and data on properties in 20 years. Data sheets are available on letterhead request from the Alloy Casting Institute, Dept. CP, 32 Third Ave., Mineola, N. Y.)



Griscom-Russell Uses ELECTRUNITE HEAT EXCHANGER TUBES

You'll find ELECTRUNITE Pressure Tubes in Bare-tube Heat Exchangers like the one shown above. And you'll find the heat exchangers on the job in all of the process industries.



One reason is Republic quality. The steel quality is controlled from ore to finished product. Before it's shipped, every length of ELECTRUNITE Tubing must pass rigid tests and conform to or surpass all code requirements. It is made to A.S.T.M. Specification A-214, or to customer specifications.

Republic customers have benefited from this quality control for more than twenty-five years in all kinds of processing equipment. Whether you're interested in new heat exchangers and condensers, or retubing, get the facts by writing for Booklet HEC-1. It's free.

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ELECTRUNITE

BOILER, CONDENSER AND HEAT EXCHANGER TUBES

ELECTRUNITE — The Original Electric Welded Boiler Tube

When inquiring check CP 3828 on handy form, pgs. 2-3

CHEMICAL PROCESSING

NEW LITERATURE

Gives complete story of swivel joints

Ball bearing swivel joints are described in 34-page catalog. Industrial applications are given. Replacement parts, lubricants, and packing units are covered. Tables and dimensional drawings also accompany text.

Cat G-4 is issued by Chiksan Co., Dept. CP, 332 Pomona Ave., Brea, Calif. When inquiring specify CP 3829 on handy form, pages 2 and 3.

Includes selection tables for plug valve actuators

Tandem actuators for plug valves requiring relatively high torques to operate, and floating bar actuators for use on valves requiring lower operating torques, are described in eight-page bulletin. Also presented is an actuator selection table, typical applications, dimensions and weights, and various mountings.

Bul 3020 is available from Ledeen Manufacturing Co., Dept. CP, 1600 S. San Pedro St., Los Angeles 15, Calif. Specify CP 3830, pages 2 and 3.

Methoxy polyethylene glycols covered in bulletin

Physical properties, specifications, and shipping data are presented for line of Carbowax methoxy polyethylene glycols. Comparative wetting efficiencies of fatty acid ester derivatives are included. Uses, such as detergents, emulsifying agents, plasticizers, and intermediates are mentioned.

Bul F-6736 is issued by Carbide & Carbon Chemicals Co., a Div. of Union Carbide & Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N. Y. Specify CP 3831, pages 2 and 3.

Describes 258 electrical switches, actuators and enclosures

Profusely illustrated, 20-page catalog pictures and describes 258 electrical switches, actuators, and enclosures. Dimensioned photographs, complete characteristics, electrical ratings, and technical data are included.

Cat 101 is issued by Micro Switch, Div. of Minneapolis-Honeywell Regulator Co., Dept. CP, Freeport, Ill. When inquiring specify CP 3832 on handy form, pages 2 and 3.



...can be the one thing
needed to complete the picture

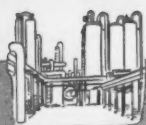
So often is diatomite filtration the vital step that page after page of this magazine would be needed to sketch briefly the processes and new developments in which it plays a key part. Without it, some of today's "wonder" products could not be available; others would not be economically practical. Diatomite filteraids, among which Dicalite products are outstanding for quality, give filtration so "sharp" that the finest micro-solids can be completely removed...yet with high rates of flow and high total throughput that make Dicalite filteraids economical in mass commercial applications. Being practically pure SiO_2 , and sterilized in processing, Dicalite filteraids are chemically inert and cannot impart taste, color, or odor to the filtrate. All these desirable properties carry no premium price tag; the experience of thousands of users shows that Dicalite filtration is frequently more economical than less effective methods.

Technical bulletins on Dicalite filtration are available on request, and our technical service department and laboratories will be glad to help you in working out any special problems.

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GREAT LAKES CARBON CORPORATION
614 SOUTH FLOWER STREET
LOS ANGELES 17, CALIFORNIA

Dependable
GLC
GREAT LAKES
Dicalite
DIATOMACEOUS MATERIALS

When inquiring check CP 3833 on handy form, pgs. 2-3



Thermal Conductivities For INSULATING MATERIAL

By ROBERT HLAVIN

Thermal conductivities for solid materials vary with temperature according to the equation

$$k = aT + b$$

where

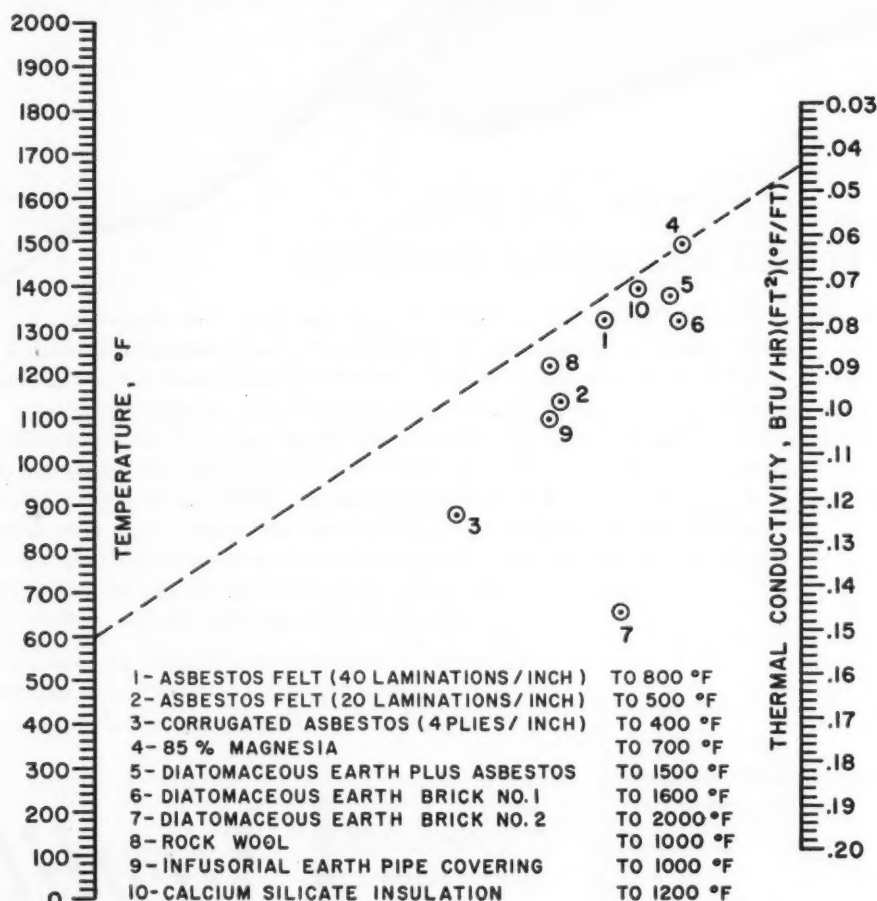
K = thermal conductivity Btu/hr/ft²/°F/ft
T = temperature °F
a & b are constants dependent on material

Nomograph is designed to solve this equation

rapidly for calculating heat losses, heat transfer, and related problems.

Typical Example

Average temperature of an 85% magnesia insulation is 600°F. What is its thermal conductivity? Extend a straight line from 600°F through point 4 for 85% magnesia insulation. Read 0.044 Btu/hr/ft²/°F/ft.



SEE WILSON FOR ALL 3

Tube Cleaners

Wilson brings you a complete line of fast-acting tube cleaners. They handle every kind of deposit, hard or soft, thick or thin or variable in depth. Driven by air, steam, water or electricity, these powerful cleaners make quick work of cleaning straight or curved tubes.

Tube Expanders

Wilson Tube Expanders are precision-made. Their smooth, efficient rolling action insures firm seating of the tube ... provides perfectly rolled joints ... reduces time-wasting re-rolling and re-inspection. There is a Wilson Tube Expander for every need from 3/16" ID to 12" ID and up.

Special Tools

Wilson also offers a wide range line of boiler maintenance and erection tools. The handy chamfering tool shown at right chamfers the tube edge to a 45° surface at high speed ... makes repairs much faster than outdated hand methods. Also available is an inside chamfering tool for placement of chill rings. Write for more information on these tools.

Representatives in all principal cities

THOMAS C. WILSON, INC.

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TW 840

WILSON

TUBE CLEANERS • TUBE EXPANDERS

When inquiring check CP 3834 on handy form, pgs. 2-3

CHEMICAL PROCESSING

NEW LITERATURE

Indexes literature (1946-1950) on spectrochemical analysis

Third part of series of bibliographical surveys of literature of spectrochemical analysis covers years 1946-1950. References and abstracts are listed chronologically and in alphabetical order of author's name in this exhaustive 226-page index. Detailed subject index includes 1246 references.

ASTM Special Tech Pub 41-C "Index to Literature on Spectrochemical Analysis — Part III" may be obtained by remitting \$4.50 to American Society for Testing Materials, Dept. CP, 1916 Race St., Philadelphia 3, Pa.

Fiber shipping containers — the complete story

This 1954 edition of "The Manufacture of Fibre Boxes" has been enlarged to 184 pages. It includes new chapters and revisions of the old to bring them up to date. Subjects — from requirements and styles to tests and selling — are covered. The well-illustrated volume also contains four pages of reference material and an easy-to-use appendix.

"The Manufacture of Fibre Boxes", 1954 edition, is available at \$7.00 the copy direct from Board Products Publishing Co., Dept. CP, 228 N. LaSalle St., Chicago 1, Ill. Specify CP 3835, pages 2 & 3.

Magnetic and belt conveyors covered in 32-page book

Illustrated 32-page book gives engineering data and special engineered applications of magnetic, tube, and steel belt conveyors. Included in booklet are six pages of scaled engineering drawings which show typical applications of various conveyors.

Cat 370 is issued by Prab Conveyors, Inc., Dept. CP, 19815 E. Nine Mile Road, St. Clair Shores, Mich. Specify CP 3836, pages 2 and 3.

Describes application, operation of direct-fired air heater

Applications, operation, typical sizes of direct-fired air heater are detailed in two-page bulletin. Units described provide source of heat for applications where products of combustion can be mixed with air being heated.

Bul 104 is issued by Thermal Research & Engineering Corp., Dept. CP, Conshohocken, Pa. When inquiring specify CP 3837, pages 2 and 3.

Here's how to:



Modernize your operation

With Spiratube you can put even your oldest machining operations years ahead. Now, with Spiratube, you can eliminate such maintenance-heavy set-ups as ball-and-socket joints, rigid ducting in off-center mixing operations — and the like. Spiratube rides with ease through any operation where an exhaust hood must follow the work. For instance, more and more wood-working operations are using Spiratube in place of more cumbersome ball-and-socket systems, and many important buffing operations are more modern, trouble-free with Spiratube at the end of moving exhaust hood.



Simplify plant maintenance

There's a type of Spiratube available for every important maintenance operation in your plant... as an integral part of your dust-collection system, for the transfer of fumes or light solids, or even for the removal of abrasive chips from large automatics. And remember, you install Spiratube when and where you need it — yourself!



Cut fume removal and air handling costs

You're missing a good bet if you haven't discovered the many advantages of using Spiratube as an important part of your ducting system. It is a lightweight, retractable, noncollapsible ducting offering optimum flexibility to take tight turns up to 180° without buckling! And, because YOU can install Spiratube yourself in a fraction of the time it takes to install rigid ducting, you save money... and production downtime. No special elbows or fittings are needed with Spiratube.



Adapt your exhaust to the work

Spiratube ranks unchallenged for the removal of paint and welding fumes, gases, and odors, for, when connected to permanent or temporary exhaust systems, its amazing flexibility permits you to bring the exhaust to the very origin of the fumes... eliminating the cost and time of moving the work to the exhaust.

with FLEXIBLE'S LINE OF TUBING ... industry's most versatile ducting



CORPORATION
Guilford, Connecticut
Pasadena 1, California

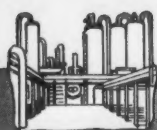
Where to get FLEXIBLE's line of ducting

Spiratube is available from well-stocked distributors from coast to coast in diameters of from 3" to 30" with various fabrics and coatings and a special Thermaplastic Scuffstrip for extra rough usage.

For diameters less than 3", or where wide temperature and pressure ranges are a big problem, ask your local Flexible Tubing Distributor about Flexflyte.

WRITE FOR ILLUSTRATED CATALOG C2-4

When inquiring check CP 3838 on handy form, pgs. 2-3



Heat Content of Refractories

By GEORGE E. MAPSTONE and J. T. MUNDAY

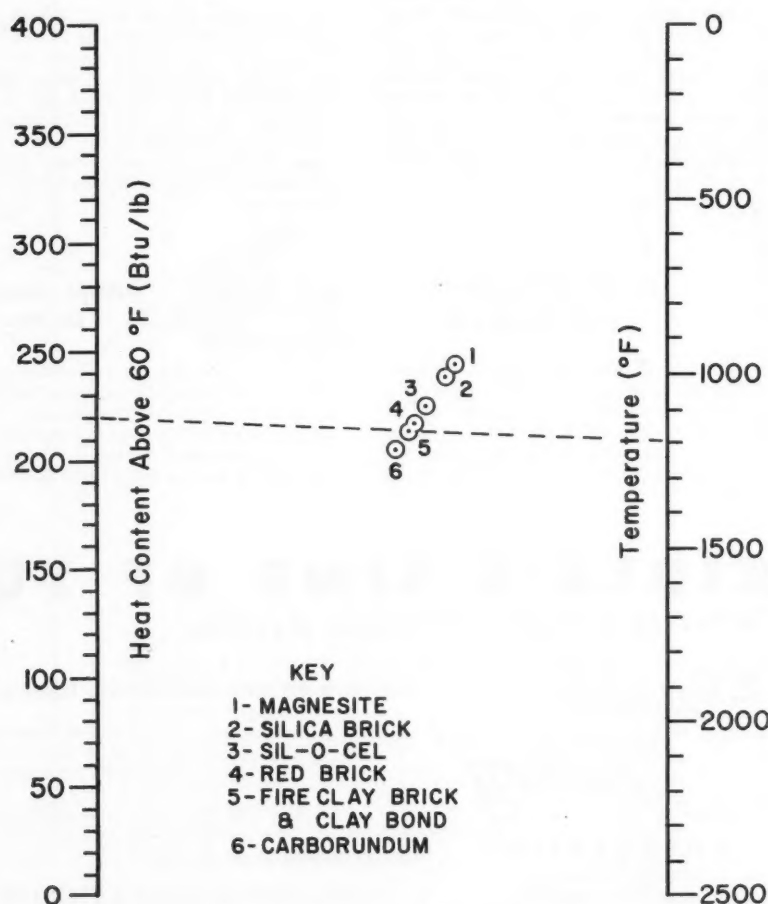
Edited by D. S. DAVIS
Professor of Chemical Engineering
Virginia Polytechnic Institute

Heat content of refractories above a suitable reference temperature is a function of 1) specific heat of the material and 2) temperature. This chart is used to find heat content of some common refractories above a reference temperature of 60°F.

Typical Example

What is the heat content of a fireclay brick at 1200°F? Running a straightedge through 1200°F and point 5 (for fireclay brick), heat content is seen to be 220 Btu/lb above 60°F.

LITERATURE CITED. "Gas Engineers' Handbook," p 234, McGraw-Hill Book Co., New York (1934)



Clean heating surface improves heat transfer, speeds production—when film has been completely removed by Buflovak-Dopp Scrapers.

Buflovak-Dopp Kettles with scraping agitator

... make a better product, speed production, save money

Buflovak-Dopp Scrapers, used in Buflovak-Dopp Kettles, result in savings up to 80% in production time on some products ... attractive profit-building savings when processing any material. For clean heating surfaces accelerate heat transfer and are therefore most important for efficient processing.

When pasty materials are being cooled, these scrapers constantly remove stagnant material from kettle wall ... and move it to center of mass in the kettle for uniform mixing. When processing heat-sensitive materials, the continuous action of these scrapers prevents material from burning on the heating surface.

To get the type of kettle and scraper that will meet your needs, the safest procedure is to process a quantity of the product in the Pilot Plant of our Research and Testing Laboratory ... and observe the results. Using this basic data, kettles can be designed and built to fulfill your specific requirements.

Write for your copy of Catalog 356-R, to get more complete information about processing kettles.

BUFLOVAK EQUIPMENT DIVISION

BLAW-KNOX COMPANY

1645 Fillmore Avenue, Buffalo 11, New York



BUFLOVAK PRODUCTS: evaporators • dryers (atmospheric and vacuum) • solvent recovery and distillation equipment • chemical plant equipment • food processing equipment • kettles • fabricated processing equipment • vulcanizers • plus a complete Pilot Plant for pretesting processes and products.

When inquiring check CP 3839 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Air conditioning equipment covered in three catalogs

Packaged water chillers, reciprocating compressors, and self-contained air conditioner are described in three separate bulletins.

Bul DS-352 gives complete information, including capacity tables and roughing-in dimensions, on factory assembled water chillers available in capacities from 10 to 100 tons.

Bul DS-361 gives specification and operating features for reciprocating compressors with capacities from 10 to 100 tons.

Bul DS-362 presents line and wiring diagrams, and capacity tables of self-contained air conditioning units with capacities from 3 to 20 tons.

Buls DS-352, DS-361, DS-362 are available from The Trane Co., Dept. CP, 202 Cameron Ave., La Crosse, Wis. When inquiring specify CP 3840 on handy form, pages 2 and 3.

Efficient movement of abrasives provided by pumps

Units with ability to move abrasive with an efficiency close to that of clear water pumps, over long periods of time, are presented in 16-page bulletin. Hand, dredge, and slurry pumps are described and illustrated. Performance tables for units are included.

Cat 953 is available from The Allen-Sherman-Hoff Co., Dept. CP, 259 E. Lancaster Ave., Wynnewood, Pa. When inquiring specify CP 3841 on handy form, pages 2 and 3.

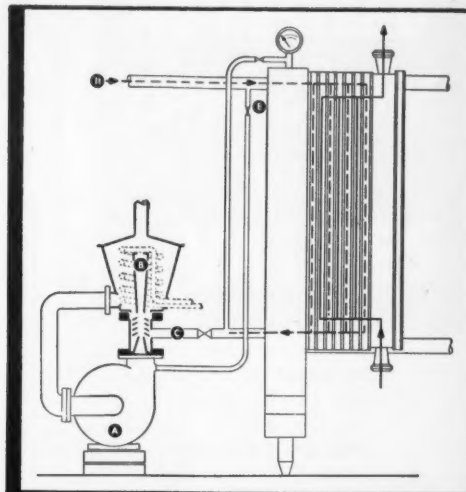
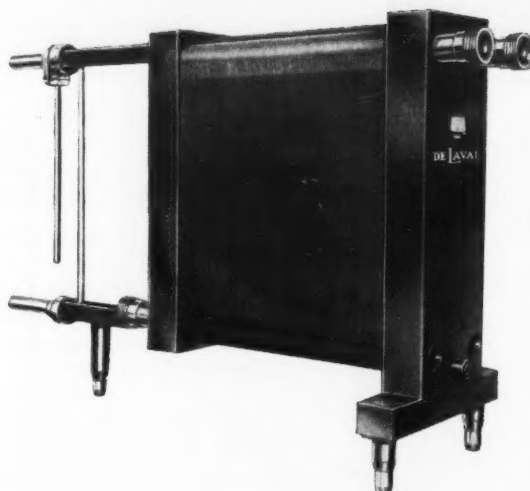
Covers delayed-action accelerators for furnace black-rubber mixtures

Use of reinforcing furnace blacks in rubber compositions increases cure rate and inherent scorching tendencies. This, plus high processing temperatures, in many instances requires the maximum in delayed action acceleration for safe factory processing. Forty-page guidebook covers chemical and physical properties of NOBS No. 1 and NOBS Special accelerators. General formulations are also presented along with typical results in natural rubber, GR-S 1500, and GR-S 1703 furnace black stocks. Graphs illustrating delayed action of accelerators are included.

Bul 836 is issued by Intermediate & Rubber Chemical Dept., American Cyanamid Co., Dept. CP, Bound Brook, N. J. When inquiring reader may simply specify CP 3842 on the convenient Reader Service slip which is located between pages two and three.

NOW!

"PIN-POINT" TEMPERATURE CONTROL IN PROCESSING LIQUIDS...



For heat exchanger processing—where precise control of heating medium temperature is demanded—no technique can match the accuracy of a De Laval Vacuum-Steam Heating System with De Laval Heat Exchanger.

This De Laval system provides positive "hair trigger" response to each call for temperature change . . . practically eliminates time lag . . . avoids any possibility of "burn on" . . . holds the "split" between heating medium and product temperatures to extremely close limits.

The diagram at right shows how the basic principle of the De Laval system assures a uniform product quality never before achieved.

Today . . . write for complete details about the De Laval Vacuum-Steam Heating System and De Laval Plate Heat Exchangers. There are no finer.

Shown above is a diagram of the De Laval Vacuum-Steam Heating System. Connecting with the steam side of the plates in the heating section is a vacuum apparatus consisting of centrifugal pump (A) which circulates water through water jet (B) in circulating tank. Jet is connected to condensate outlet (C) so that jet suction creates vacuum in heating section. This causes steam entering the unit (D) to expand to degree of vacuum thus created, and the temperature of the steam to be lowered to the desired point. Expanding steam is prevented from becoming super-heated by saturating device (E).

DE LAVAL

PLATE HEAT EXCHANGERS



THE DE LAVAL SEPARATOR COMPANY

Poughkeepsie, New York • 427 Randolph St., Chicago 6
DE LAVAL PACIFIC CO., 61 Beale St., San Francisco 5

When inquiring check CP 3843 on handy form, pgs. 2-3



Estimating Concentration of RECIRCULATED COOLING WATER

By JULIAN F. MOTE

Edited by D. S. DAVIS

Professor of Chemical Engineering
Virginia Polytechnic Institute

Decreased reserves of fresh cold water have led to more extensive use of recirculating water cooling systems. In such systems, concentration of dissolved material becomes greater than that of make up water because of evaporation loss. "Cycles of concentration" is used to indicate ratio of concentration of cooling water to that of the make up. When circulating water has twice the concentration of make up water, the number of cycles is two.

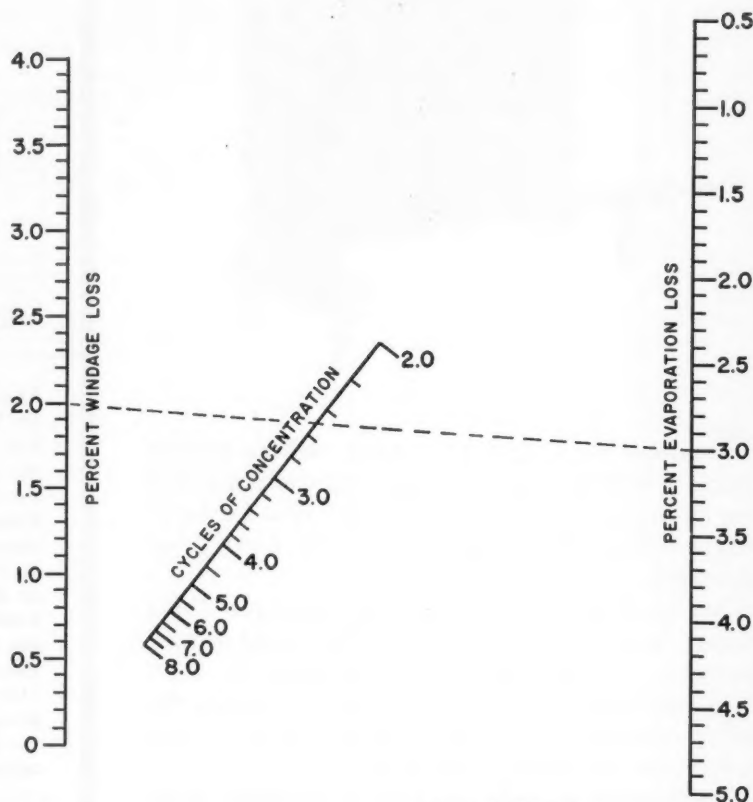
While loss by evaporation causes solution to become more concentrated, loss of fine droplets (windage or drift) tends to limit concentration. And, of course, windage is a water loss which must be made up.

Windage loss varies with type of cooling tower. These are typical values—

| Type of Cooling | Per cent Loss |
|-------------------|---------------|
| Spray pond | 1-5 |
| Atmospheric tower | 0.3-1 |
| Mechanical tower | 0.1-0.3 |

Evaporation loss can be figured as 1 per cent of the water circulated for each 10°F drop in temperature.

Chart is designed to find cycles of concentration when windage and evaporation losses are known factors.



Typical Example

Water is being cooled 30°F in a spray pond. If windage loss is 2%, what are cycles of concentration?

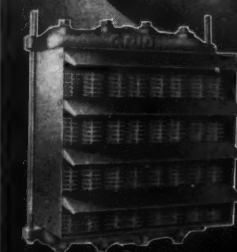
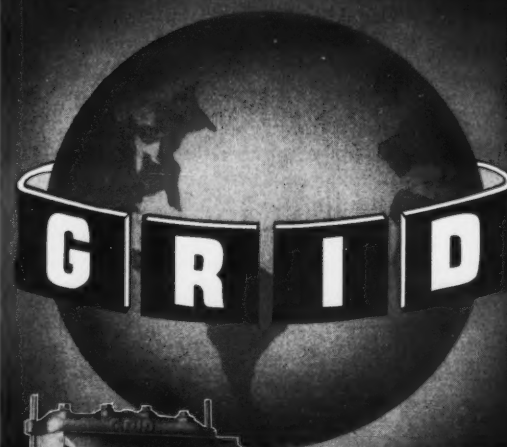
Dropping temperature 30°F means about a 3 per cent loss by evaporation. Connect this with a 2 per cent loss by windage and read cycles of concentration as 2.5.

LITERATURE CITED

BETZ, W. H. AND L. D., "Handbook of Industrial Water Conditioning," 4th Ed, pp 157-159 (1953)

IN MAJOR CHEMICAL PLANTS

Everywhere...



**UNIT HEATERS
AND
BLAST COILS**
*trouble-free
heating service
since 1929*

The reasons for this wide acceptance . . . GRID'S All-Cast construction having similar metals in contact with steam prevents electrolytic corrosion . . . GRID'S All-Cast iron construction stands up well against corrosive acid fumes of HCl, Cl₂, etc. . . GRID'S ability to withstand steam pressures up to 250# P.S.I. . . GRID'S low outlet temperatures, proper fan sizes and motor speeds assure delivery of warm comfortable air in ample volume, directly to the spot where it is needed.

ABBOTT LABORATORIES
AMERICAN CYANAMID
ANSUL CHEMICAL CO.
BUCKEYE COTTON OIL CO.
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VICTOR CHEMICAL WORKS
HOOKER ELECTRO-CHEMICAL
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ALLIED CHEM. & DYE CORP.

There are units cheaper than GRID but there is none better . . . you start saving money the day you install GRID Unit Heaters. Write today for complete catalog . . . also ask about GRID Blast Coils. They are ideal for many uses throughout the chemical processing industry (Catalog BC-1049).

D. J. MURRAY MANUFACTURING CO.
Manufacturers Since 1883 • Wausau, Wisconsin

New Banister Dust Collector ELIMINATES DUST PROBLEMS!

Now, with today's most outstanding dust collector, the Banister Dustmaster, you can efficiently and economically solve your dust problems! The Dustmaster is a modern, efficient cyclone which separates dust from air by means of centrifugal force. It incorporates the simplest yet most practical design features. It has high collection efficiency and low energy loss; it is economical to install; and it requires a minimum of space. It has wide application in many industries for removing nuisance and hazardous dusts . . . thereby reducing equipment maintenance, increasing productivity, improving product quality, and maintaining a clean healthful working atmosphere. It's also ideal for recovering valuable materials from dust.

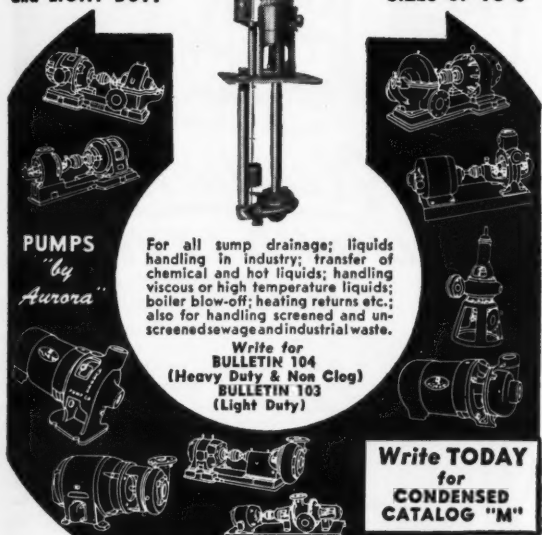
Send us your dust problem and we'll show you specifically how the Dustmaster can solve it . . . or write today for big, fully illustrated Dustmaster catalog and case history material showing how Banister Dustmaster Systems solved many so-called "impossible" dust situations. A. W. Banister Co., Inc., 21 Charles St., Cambridge, Mass. . . dust collecting and pneumatic air system specialists since 1911.

When inquiring check CP 3845 on handy form, pgs. 2-3

Aurora Vertical Sump Pumps are "TOPS"

HEAVY DUTY
and LIGHT DUTY

ALSO NON-CLOG
SIZES UP TO 8"



PUMPS
"by Aurora"

For all sump drainage; liquids handling in industry; transfer of chemical and hot liquids; handling viscous or high temperature liquids; boiler blow-off; heating returns etc.; also for handling screened and un-screened sewage and industrial waste.

Write for
BULLETIN 104
(Heavy Duty & Non Clog)
BULLETIN 103
(Light Duty)

Write TODAY
for
CONDENSED
CATALOG "M"

DISTRIBUTORS IN PRINCIPAL CITIES



AURORA
PUMP COMPANY
DIVISION OF THE NEW YORK AIR BRAKE COMPANY
62 LOUCKS STREET, AURORA, ILLINOIS

When inquiring check CP 3846 on handy form, pgs. 2-3

NEW LITERATURE

Chart outlines care of fork lift trucks

Preventative maintenance chart for electric fork trucks shows proper steps for daily, weekly, and monthly servicing and inspection. Chart covers eight weeks of truck operation.

To obtain copies of maintenance chart write Service Dept., Lewis-Shepard Products, Inc., Dept. CP, Watertown, Mass. When inquiring specify CP 3847 on handy form, pages 2 and 3.

Offers more insulation pound for pound

More insulating qualities, pound for pound, are said to be offered by product described in 4-page bulletin. Insulation discussed, a forest product, is not attractive to rodents and insects and has no odor.

Bulletin on SilvaWool is issued by Special Products Division, Weyerhaeuser Timber Company, Dept. CP, Tacoma Bldg., Tacoma, Washington. When inquiring specify CP 3848 on handy form, pages 2 and 3.

Describes fans for industry

Heavy-duty fans adapted to diversified air and material handling applications are described in four-page bulletin. For all equipment pictured special construction, coatings, and various accessories can be furnished making it adaptable for such services as handling corrosive fumes, explosive gases, exhausting from ovens, and handling heavy materials.

Performance and general specification data on fans are graphically explained.

Bul 702 is issued by Clarage Fan Co., Dept. CP, 619 Porter St., Kalamazoo, Mich. Specify CP 3849, pages 2 and 3.

You can end valve operating difficulties
in HIGH TEMPERATURE, HIGH PRESSURE
and CORROSIVE SERVICES with . . .



HOMESTEAD
Lever-Seald
**PLUG
VALVES**

THEY ARE
STICK-PROOF . . .
OPERATE INSTANTLY

ASSURE DEPENDABLE, TROUBLE-FREE CONTROL
OF "HARD-TO-HOLD" FLUIDS

A positive mechanical means for (1) relieving seating pressure to permit easy operation, and (2) for pressing the tapered plug firmly into its seat to give drop-tight service, is built into every Homestead Lever-Seald Valve. All operating parts and seating surfaces are fully protected from the corrosive or erosive effect of line fluids.

That is why Lever-Seald Homestead Valves are noted for their extremely long continuous service, with a minimum of maintenance. They are available in semi-steel, steel, stainless, bronze, and other alloys suitable for the service conditions.

Mail the coupon today for full details.

Without obligation, please send me
VALVE REFERENCE BOOK No. 39-3
covering Homestead Lever-Seald Plug Valves.

NAME _____ TITLE _____
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ADDRESS _____
CITY _____ STATE _____

HOMESTEAD VALVE MANUFACTURING COMPANY

"Serving Since 1892"

P.O. Box 140

Coraopolis, Pa.

When inquiring check CP 3850 on handy form, pgs. 2-3

INSTALL peak performance INTO YOUR compressors

(AIR • GAS • AMMONIA)

Peak performance, maximum efficiency, greater output, and lower power costs can be built into your oldest, and of course your newest, compressors by the installation of VOSS VALVES.

Check THESE VOSS VALVE ADVANTAGES:

- ✓ Quiet, vibration-free operation
- ✓ 20 to 60% more valve area
- ✓ less power consumption
- ✓ minimum pressure loss
- ✓ normal discharge temperature
- ✓ lower operating costs
- ✓ utmost safety

Our detailed proposal for increasing the efficiency of your compressor will be sent you without obligation. Send us the name, bore, stroke, and speed of your machine.

VOSS VALVES
REG. U.S. PAT. OFF.

VOSS VALVES / J. H. H. VOSS Co., Inc. 785 East 144th Street, New York 54, N. Y.

When inquiring check CP 3851 on handy form, pgs. 2-3

Filter Presses Don't "Obsolesce"

- If filtration capacity drops in time due to wear of plates, they can easily be re-machined or replaced at moderate cost to bring the filter up to top notch performance.
- Filter chambers may be added or removed for expanded or reduced capacity.
- New types of plates may be installed on the same filter press for new operations.
- If no longer needed, there is always a ready market at a favorable price in the used equipment field.
- And there are other factors—the efficiency of clarification, cake recovery, extraction, washing, drying and thickening—all in one piece of equipment.



Typical of more than 150 Shriver Filter Presses installed in the plant of a leading producer of fine chemicals over the past 40 years. Included are presses with washing and non-washing type filter plates, of cast iron, stainless steel, bronze, aluminum, rubber and wood.

for all of these and more—you can't beat

SHRIVER FILTER PRESSES

T. SHRIVER & COMPANY, INC. • 846 Hamilton St., Harrison, N. J.

Filter Presses • Filter Media • Diaphragm Pumps

Sales Representatives

The Merrill-Brose Co.
2792 Cypress St.
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Process Eng. & Equip. Co.
331 Thornton Ave.
St. Louis 19, Mo.

The Watts Co.
P. O. Box 8188
Houston, Tex.

Richardson Agencies, Ltd.
Toronto, Ont.
Montreal, Que.

When inquiring check CP 3852 on handy form, pgs. 2-3

NEW LITERATURE

Guide to selection of refractories

Prepared as a helpful guide for the selection of the most suitable refractory materials for specific uses, 28-page informational booklet describes available refractory products and contains engineering and other data tables useful in connection with application of refractories in the ceramic industry.

"Norton Refractories for the Ceramic Industry" is available from Norton Company, Dept. CP, 567 New Bond St., Worcester 6, Mass. When inquiring specify CP 3853, pages 2 and 3.

Preventive maintenance for air compressors

One of a series of "Trouble Savers" on preventive maintenance for air compressors, folder is designed to aid operators in locating troubles in vertical water-cooled units.

Information is clearly outlined and operators of company's YC and DYC compressors may find it practical to keep folder tacked up near or on machine.

Mailer L-676-M1 is issued by Worthington Corporation, Dept. CP, Harrison & Worthington Ave., Harrison, N. J. When inquiring specify CP 3854 on handy form, pages 2 and 3.

Ramps and pallet stackers shown and described

Illustrated folder (folds to 8 1/2 x 11" pages for filing) illustrates and describes full line of material handling equipment. Included in the publication are ramps, pallet stackers, and crane hooks.

"Materials Handling Equipment" is issued by Elizabeth Iron Works, Inc., Dept. CP, Box 360, Elizabeth, N. J. Specify CP 3855, pages 2 and 3.

Take surface temperatures

quickly, accurately...

with the

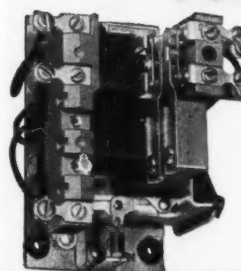


The handy Alnor Pyrocon is unequalled for quick, accurate reading of all surface temperatures... whether surfaces are metallic or non-metallic, flat or curved. Accurate temperatures are easily understood on the Pyrocon's direct reading scale face... without interpolation or need of conversion tables. A wide selection of thermocouples and extension arms permits adaptation to many types of service. For complete details and prices, send for Bulletin No. 4257. Illinois Testing Laboratories Inc., Room 504, 420 N. LaSalle Street, Chicago 10, Ill.

Alnor

PRECISION INSTRUMENTS
FOR EVERY INDUSTRY

When inquiring check CP 3856 on handy form, pgs. 2-3



The original — pioneered by B/W in 1933. No floats! No vacuum tubes! No moving parts in liquid. Literature describes relays and switches, automatic starter and relay combinations, multiple pump controls, special controls and panels and many application diagrams.

Controls not affected by pressures, temperatures, acids or caustics. Remote control if desired. Ice free electrodes were necessary.

WRITE FOR CATALOG

B/W CONTROLLER CORPORATION

2204 E. Maple Road, Birmingham, Mich.

FIRST IN THE FLOATLESS CONTROL FIELD

When inquiring check CP 3857 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Gives differences among silicones being used in cosmetics

Seven-page data sheet describes differences among the various silicones being used in cosmetics. Tables are included showing relative compatibility with 18 common cosmetic ingredients in concentrations ranging from 100:1 to 1:100. Wide variety of current silicone-based cosmetics and ointments being evaluated is reviewed, and suggested formulations are given for hand creams and lotions, protective ointments, sun screen lotions, and hair dressings. A short bibliography is attached.

Data Sheet #3-100 is issued by Dow Corning Corp., Dept. CP, 592 Saginaw Rd., Midland, Mich. When inquiring specify CP 3858 on handy form, pages 2 and 3.

Catalogs power transmissions for conveyors, elevators

Illustrated 340-pages thumb-indexed catalog shows chains and sprockets for conveying, elevating and power transmission. Also covered are enclosed gear drives, ball and roller bearings, clutches, pulleys, and couplings. Catalog gives complete data on all of manufacturer's products in material handling field.

Cat 950 is available from Link-Belt Co., Dept. CP, 307 N. Michigan Ave., Chicago 1, Ill. When inquiring specify CP 3859, pages 2 and 3.

Shows, explains installations of fire protection systems

Carbon dioxide and foam fire extinguishing systems for protection of plants is explained in eight-page brochure. Typical installation is described in picture-story.

Jan-July, 1954 issue of "Blazes" is published by American-LaFrance-Foamite Corp., Dept. CP, Elmira, N. Y. Specify CP 3860, pages 2 and 3.

Describes geological surveys by radioactive methods

Illustrated four-page bulletin shows radioactive equipment used in petroleum exploration and uranium prospecting. Equipment described includes shielded scintillation counter, count rate meter, and Esterline-Angus recorder.

Bulletin "Geological Surveys with Radioactivity" is issued by Nuclear-Chicago, Dept. CP, 223 W. Erie St., Chicago 10, Ill. Specify CP 3861, pages 2 and 3.



the salesman called it a steal

He was telling the truth, too—but

he didn't say who was being robbed.

compare your costs
with this:

A prominent steel and chemical manufacturer purchased 21 LaBour Type G pumps in a 7-year period. Total repair parts bought were \$3290.56, amounting to \$36.10 per pump per year in service.

As many a saddened buyer knows, "bargain" cars are almost never really bargains. Repairs and excessive oil and gas bills soon overwhelm the first-cost "savings."

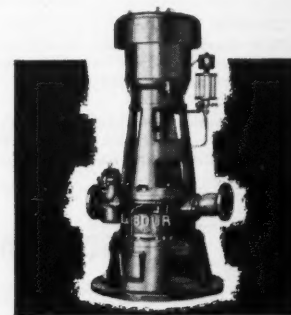
In many a chemical plant, the cost of repairs has far outweighed a small saving in original cost on corrosive-service pumps. It isn't hard to find out whether it's true in your case.

If you're using LaBour Type G pumps you'll find your maintenance costs way down, so over-all costs are way down, too. Whatever pumps you are using, it will pay you to check your repair costs. Your purchasing department ought to know the facts.

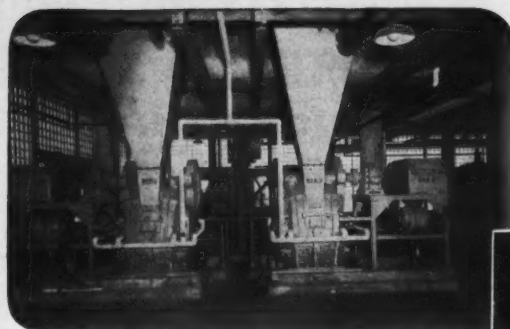
ORIGINAL MANUFACTURERS OF THE SELF-PRIMING CENTRIFUGAL PUMP

LABOUR

THE LABOUR COMPANY, INC. • ELKHART, INDIANA, U.S.A.



When inquiring check CP 3862 on handy form, pgs. 2-3



"DAVENPORT" CONTINUOUS PRESSES

These continuous presses are available in three sizes. "DAVENPORT" presses are the most efficient mechanical method of extracting excess moisture from semi-solids.

If you have a moisture problem, let "DAVENPORT" engineers assist you.

Send for our complete catalog or . . . for quick reference . . . consult your Chemical Engineering Catalog, 1953 or '54.



When inquiring check CP 3863 on handy form, pgs. 2-3

VERSATILE BULK FEEDING . . . from a trickle to a torrent with VELOFEEDER

A mechanical vibrating feeder especially designed for free-flowing chemicals, fertilizer, pellets and similar materials at lower cost, higher efficiency.

Here's Why!

Higher Output—300 to 50,000 lb./hr. hard granular materials; 300 to 30,000 lb./hr. soft ground materials.

Lower Power Needs— $\frac{1}{8}$ hp. motor powers unit—inexpensive as a 100-watt light bulb!

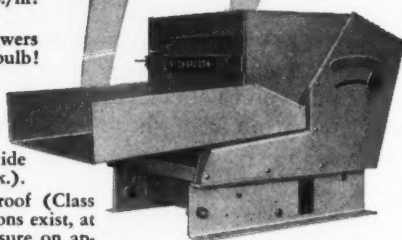
Smaller Space Needs—35 inches long, 17½ inches wide, 19 inches high. Standard vibrating tray 16 inches wide—stainless steel when required.

Easier Control—simple adjustment over wide operating range (near 0 to 50 fpm. max.).

Safer Operation—motor is explosion-proof (Class 2, Group G), where hazardous conditions exist, at slight extra cost. Complete dust enclosure on application.

Less Vibration—working frequency is 1850 vibrations per minute; little or no vibration is transmitted to mounting installation (mounts with only 4 bolts!).

If you're interested in better bulk feeding at lower operating cost, write for Bulletin 5302 with complete specifications and drawing.



Richardson SCALE COMPANY, Clifton, New Jersey

Atlanta • Boston • Buffalo • Chicago • Detroit • Houston • Memphis • Minneapolis
New York • Omaha • Philadelphia • Pittsburgh • San Francisco • Wichita • Montreal
Toronto • Havana • Mexico City • San Juan

MATERIALS HANDLING BY WEIGHT SINCE 1902

When inquiring check CP 3864 on handy form, pgs. 2-3

NEW LITERATURE

Chlorobenzenes described

Physical characteristics, solubilities, end uses, and chemical derivatives of monochlorobenzene, *o*- and *p*-dichlorobenzene, and 1,2,4-trichlorobenzene are described in 12-page bulletin.

"Chlorinated Benzenes" is available from Organic Chemical Sales, The Dow Chemical Co., 1000 Main St., Midland, Mich. When inquiring specify CP 3865 on handy form, pages 2 and 3.

Lists wide range of lab items

Illustrated four-page leaflet shows latest equipment for laboratory use. Laboratory agitators, dehumidifiers, test cabinets, portable hardness tester, and ultraviolet light source are some of the items described and illustrated.

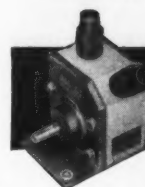
"Newsletter No.4" is issued by Gardner Laboratory Inc., Dept. CP, 4723 Elm St., Bethesda 14, Md. When inquiring specify CP 3866 on handy form, pages 2 and 3.

Provides complete data on Dall Flow Tube

Illustrated 16-page engineering bulletin describes Dall Flow Tube, a differential producing metering device. Bulletin includes information on recovery characteristics, accuracy, applications, range, flow formula, laying length, and working pressure of the device. Tables and graphs are included in bulletin to aid in selection of proper flow tube and accompanying secondary instruments.

Tech Bul 115-L3 is issued by Builders-Providence Inc., Dept. CP, 345 Harris Ave., Providence, R. I. When inquiring reader may simply specify CP 3867 on handy form, pages 2 and 3.

VANTON PUMP TAMES CORROSIVE CHEMICALS



rigid-unplasticized PVC flex-i-liner PUMPS

are designed to handle the toughest corrosive chemicals and abrasive slurries.

The durable precision molded flexible liner and the pump body block are the only parts contacting the fluid.

- No stuffing boxes, shaft seals, check valves, glands or gaskets to worry about.

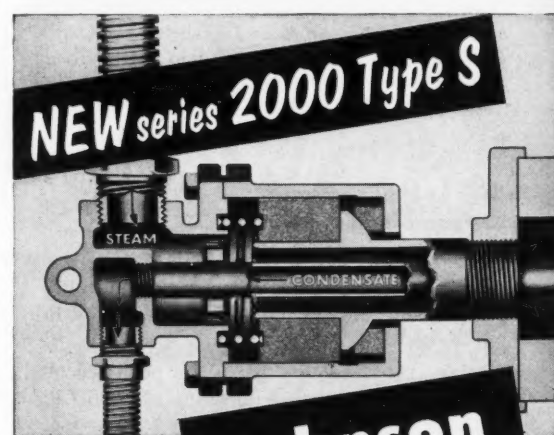
Body blocks in: Polyethylene, Bakelite, Buna N Hard Rubber, unplasticized PVC, Stainless Steel. Flexible liners in: Natural and pure gum rubber, Neoprene, Hycar, Buna N, Vinyl, Compac and Silicone. The wide choice of materials means trouble free, corrosion free service.

Pump capacities from fractional to 20 gpm. Illustrated booklet on request, as well as descriptive literature on complete line of corrosion resistant centrifugal pumps, valves, pipe and fittings.



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PUMP & EQUIPMENT CORP.
EMPIRE STATE BLDG. NEW YORK 1, N. Y.

When inquiring check CP 3868 on handy form, pgs. 2-3



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WRITE FOR NEW CATALOG



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When inquiring check CP 3869 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Now THE NEW
Schmieg
CENTRI-MERGE
Vertical Rotor Type
DUST and FUME
Eliminators

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COLLECTION and
ELIMINATION Efficiency

An important new Schmieg development to wash hazardous dust and fumes from the air in a rotating torrent of water, combining the cyclonic principle of dust separation and positive high pressure water action.

**Available
in Two Types**

1. For wet collection and elimination only.
2. For primary dry and secondary wet collection and elimination, with built-in dry type pre-cleaner.



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500 to 50,000
C.F.M.

Just a few of many reasons why a new Centri-Merge unit is your best investment in operating efficiency and economy:

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Write or phone for Bulletin VU 8-53, describing the new Vertical Rotor Units. Then consult with Schmieg engineers to plan a Centri-Merge installation for maximum dust and fume collection and elimination efficiency in your plant.



When inquiring check CP 3870 on handy form, pgs. 2-3

NOVEMBER, 1954

COLOR FILM

(Continued from page 11)

Dr. Staud wonders whether his innocence might not have been one of the factors in selecting him for the errand. Had someone who presumably knew the "impossible" nature of the task asked for such a film, the reaction of the coating superintendent might have been less than cordial.

The prize set of difficulties came one step later. Mannes and Godowsky, with the help of Dr. Mees and the Kodak laboratories, did have such a film. But, had they taken a picture with it and developed it in the normal way, they would have gone through an enormous amount of work only to produce a black-and-white negative. There remained the trick of putting it in color as a positive.

In order to do this, they proposed to develop the film, changing exposed silver halide to metallic silver. This would correspond, by its layer, to intensity of each color. More important, this development would leave unchanged (sensitive) silver halide proportional to the absence of the color to which the layer was sensitive. A second exposure to light was to be followed by development with dye intermediates (coupling agents) and a developer which yielded a dye as an end product. Hence with the positive silver image, a dye image would be formed.

But the color of the dye image would be complementary to the color of the sensitivity in each layer. Thus a yellow image in the blue-sensitive layer; magenta in the green; cyan in the red. When the silver was removed, then, a dye image would remain. This image would have an intensity proportional to the absence of its complementary color — producing a true color picture of the original scene.

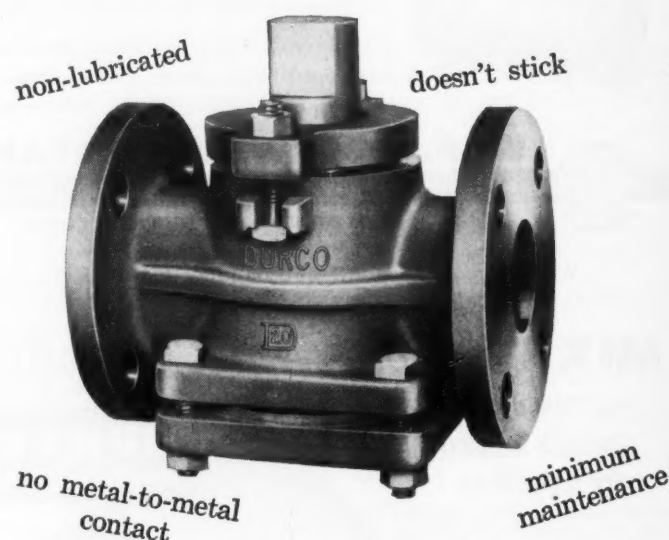
Complicated? Incredibly so. But not half so bad on paper as it was in practice. Problems involved matching sensitizers to final color, maintaining proper speed in each color, and above all, finding sensitizing dyes which did not wander willy-nilly from one emulsion layer to another and destroy all that was gained through the other techniques. Wandering dyes were the greatest single stumbling block until the early '30's.

When once a set of dyes had been found which would hold still in the film, work began to progress in earnest. This happened in the period 1928-1930. A group of chemists working under Dr. Brooker were able to produce what had been thought impossible — dyes that didn't migrate. Eastman's policy of making the chemicals it needed, regardless of cost or trouble, was the factor that broke the somewhat hopeless cycle of trial and error. Since that time, Eastman chemists have turned up an average of one new dye a day . . . about 5% of which don't wander. With something more than hope and determination to work with, Dr. Mees invited Mannes and Godowsky to come to Rochester and work closely with the laboratory staff. Up to that time contacts were leisurely; tests results were available in a few weeks after new materials were coated. But with

(Continued on next page)

the valve for

66° Bé Sulfuric Acid service



DURCO type F valve

Available in sizes 1/4" through 2".

Why not mail the coupon for full details?

The Duriron Company, Inc. Dept. CP
Dayton, Ohio

Please send details on Durco Type F Valve.

Name

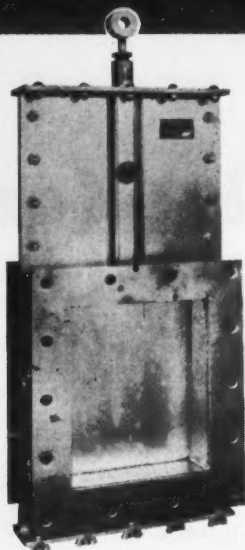
Company

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**EASY TO CLEAN
WITHOUT REMOVING VALVE
FROM LINE OR EQUIPMENT**

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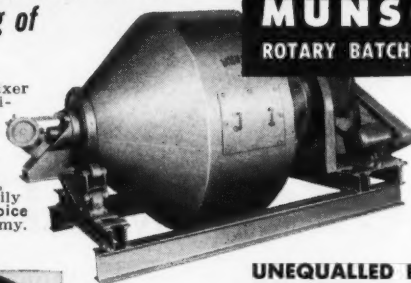
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When inquiring check CP 3872 on handy form, pgs. 2-3

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... the **TUMBLING ACTION** mixer for intimate blending of dry ingredients

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MULTIPLE-
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ACTION!**



Lifters continuously cut out and lift ingredients as drum slowly revolves. Rotating cone tumbles stock to center. Conveyor flights on mixer shaft also agitate stock back to center — where mixing cycle repeats. Empties completely after every mix.

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Feeds, Cereals,
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MUNSON MILL MACHINERY CO. Dept. P-1154 Utica, New York

When inquiring check CP 3873 on handy form, pgs. 2-3

(Continued from preceding page)

the work consolidated a new era of "make it today, test it tonight, we'll look at it in the morning and decide" began.

By 1934, Dr. Mees, Dr. Staud, and other staff members were joking about their "two-and-one-half" color process. They almost had a three-color film that produced satisfactory results.

Late in 1934 the first Kodachrome was available for limited use. Control of the coating sometimes did not quite split hairs as it should have (though inaccuracies would have been well within limits for dozens of other products). There was a serious waste problem. Despite all this, people were getting good color pictures. In 1935 Kodachrome was released to the public.

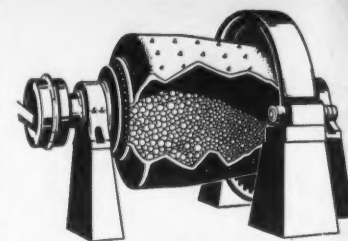
At this point, Dr. Mees made a bet (loser to buy a dinner for the staff) that within three years half of the 16mm movie film sold would be color film. Oldtimers still remember the dinner party that took place in two years instead of the three that Dr. Mees had allowed himself.

What else is ahead for color photography? Plenty of old and new problems, for one thing. And, in general, a growing market for both still and motion pictures in color. In the professional motion-picture field, for example, a quite large and varied group of color processes are now being used. They include such well known names as Warnercolor, Pathecolor, Technicolor, Ansco color, Trucolor, DeLuxe etc.

In recent years an increasing percentage of Hollywood and New York productions has been in color. Many producers of television films are also shooting color, against the day when color television is more widely available. Kodak is represented in this trend to color movies by the Eastman Color negative and positive films which became available within the last few years. Producing a practical multilayer movie film was a tough one for the Kodak laboratory to crack — 17 years of work stood behind its announcement.

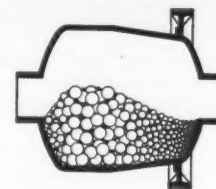
Another interesting problem is keeping Kodak research people at work these days — color lithography. Standard printing techniques for reproducing art in "four color process" are tricky, moderately involved, and expensive. Despite the fact that Eastman Kodak does not envision a large market in any new methods for accomplishing such printing, they do feel that printing techniques will have to improve to permit wide applications of color photography to the graphic arts.

Color photographs have become commonplace with us. They are produced by routine processes which have become commonplace to the men who operate them. Even so, the chemistry or even the basic idea behind the method is complexity incarnate. The fact that such pictures exist, is a tribute to the determination of George Eastman, Dr. Mees, and all the other members of the team who have explored and conquered this never-never land of color photography.

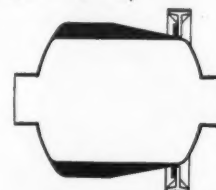


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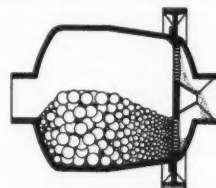
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CHEMICAL PROCESSING

PROCESSES, EQUIPMENT and MATERIALS



Use this "quick-locator" when you want information on a specific type of process, equipment or material mentioned in the processing stories or the advertisements in this magazine. Everything discussed in this issue is given here, if you want more data you can write manufacturer direct . . . or turn to pgs. 2-3 and use the handy "Information Request Slip." This is a special service provided by the publisher . . . no obligation or charge, of course. The publisher contacts the proper manufacturers for you—information comes to you direct.

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If you use filter systems...

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OF THE REVOLUTIONARY

Dualaire*

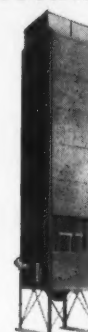
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No pressure surges!

No filter choking!

Efficiencies up to 99.99%!



Why The DUALAIRE Is Better!

Here's the heart of the DUALAIRE principle. Gas enters through top of filter tube (A). Dust is filtered out along length of filter surface and as it begins to build up (B), the slight change in differential pressure causes the reverse-jet blow ring to go into operation. This ring fits tightly around the filter tube and concentrates a jet of air (C) that blows from the outside inwardly through the filter fabric (D).

As the ring moves up and down the tube, the fabric is flexed and blown at the same time, thus loosening the dust in small portions. The blow ring travels up and down the filter tube until the filter is clean, then automatically stops until the tube again requires cleaning.

Cleaning action is uniform and steady. There are no sudden pressure surges as filter surface is cleaned — no destructive rapping or jarring operations to shorten life of filter element — no wide variations in gas flow or plant efficiency!

If you use bag-houses or other similar collecting systems in your plant operations, be sure to investigate the many vital advantages built into Western Precipitation's new DUALAIRE Dust Collectors. Backed by the same well-known organization that pioneered commercial application of COTTRELL Electrical Precipitators and MULTICLONE Mechanical Collectors, DUALAIRES bring entirely new performance and efficiency standards to filter-type collection systems.

As outlined at the left, heart of the DUALAIRE is a reverse-jet blow ring that travels up and down the cloth filter tube, keeping it clean without the alternate choking and pressure surges characteristic of conventional rapping, vibrating, or jarring systems of cleaning off the collected dust.

Result—

► **UNIFORMLY LOW PRESSURE DROP** is assured, because the collected dust is removed steadily and in small increments — not by sudden surges!

► **UNIFORMLY HIGH EFFICIENCIES** — as high as 99.99% under actual field conditions — are maintained by the constantly-cleaned filter surfaces. There is no "choking" action — no variation in filter efficiency as dust accumulates!

► **LONGER FILTER LIFE** is obtained because the filter fabric is not subjected to destructive jarring, rapping and vibration of conventional filter cleaning methods. The Dualaire cleaning action is gentle — yet far more effective!

► **LESS EQUIPMENT IS REQUIRED** to handle a given capacity with the Dualaire because no standby sections need be provided for gas cleaning while other sections are shut off for rapping.

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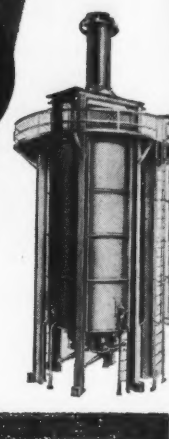
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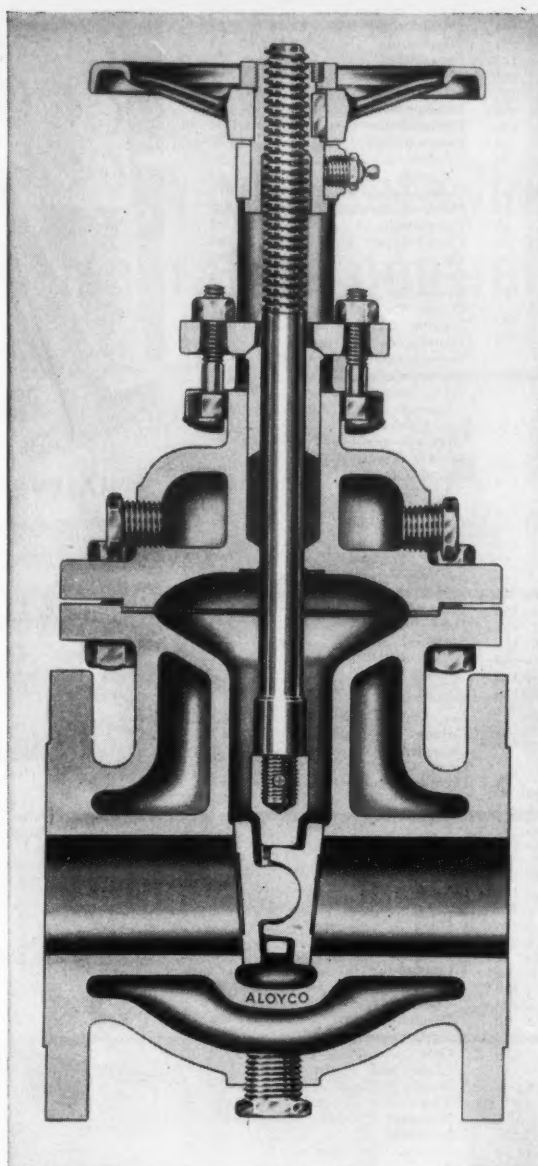
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Cross-section shows how jackets extend to edge of flanges and include stuffing boxes on this Aloyco 1105 Jacketed Gate Valve. Also shown are the non-fouling, ball-and-socket split-wedge disc and mar-proof rocker-type gland plate and follower.



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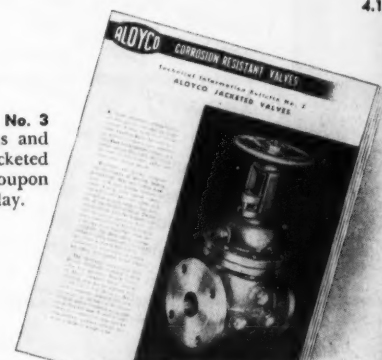
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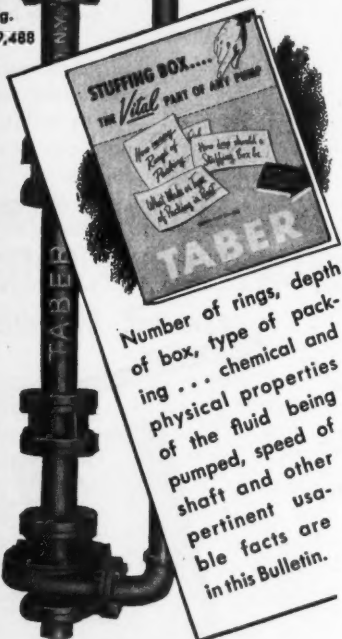
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Fig. 19,488

STUFFING BOX....
THE *Vital* PART of ANY
PUMP.
How many Pumping Stations?
What Work is left of Packing in them?

Number of
of box, typ
ing ... c'
physical
of the
pumper
shaft
perti
ble
in

Fig.
19,488



Number of rings, depth of box, type of packing ... chemical and physical properties of the fluid being pumped, speed of shaft and other pertinent usable facts are in this Bulletin.

Fig. 6041

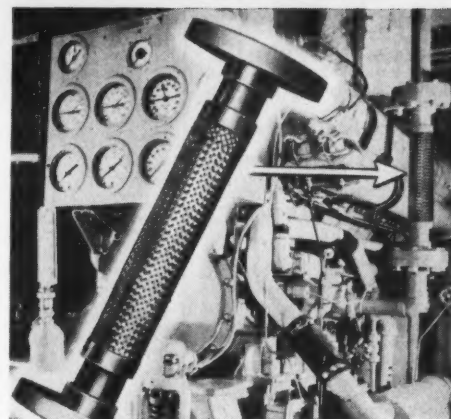
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Fig. 6041

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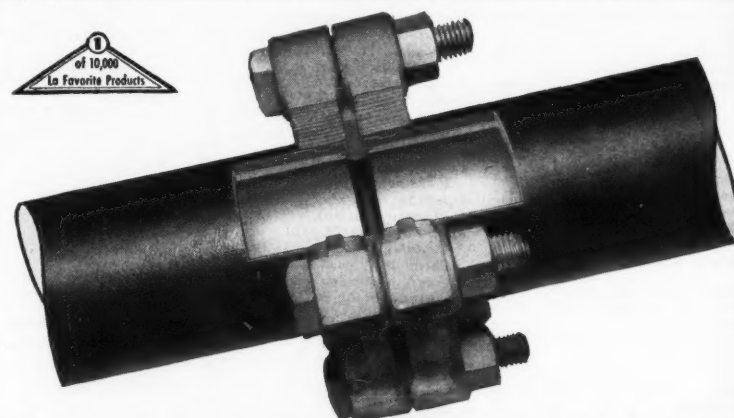
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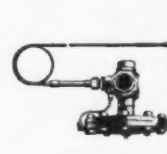
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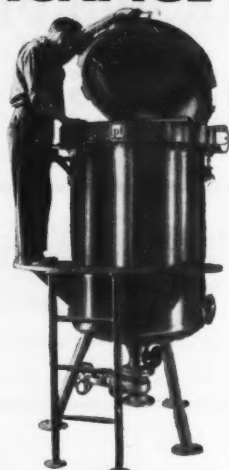
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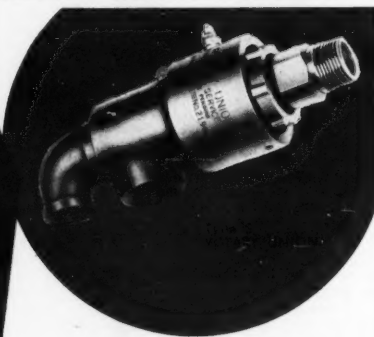
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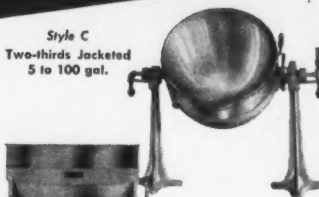
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COOKING KETTLES

Style C
Two-thirds Jacketed
5 to 100 gal.



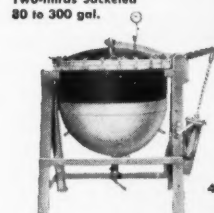
Style A
Two-thirds Jacketed
5 to 500 gal.



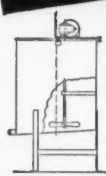
Style B
Full Jacketed
10 to 300 gal.



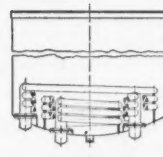
Style CW
Two-thirds Jacketed
80 to 300 gal.



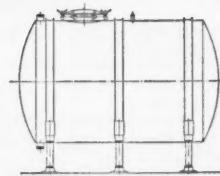
Pressure Kettle
Two-thirds Jacketed
40 to 200 gal.



Mixing Tank
25 to 500 gal.



Pulp Tank
500 to 2,000 gal.

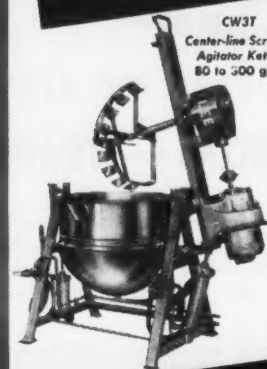


Storage Tank
100 to 5,000 gal.

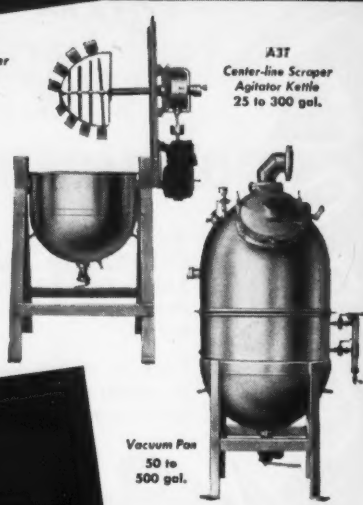
MIXING, COOKING & STORAGE TANKS

MIXING AND BLENDING UNITS

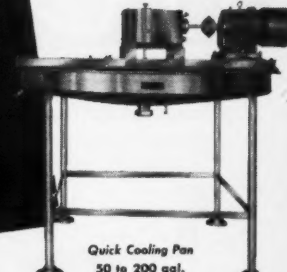
CW3T
Center-line Scraper
Agitator Kettle
80 to 300 gal.



A3T
Center-line Scraper
Agitator Kettle
25 to 300 gal.



Vacuum Pan
50 to 500 gal.



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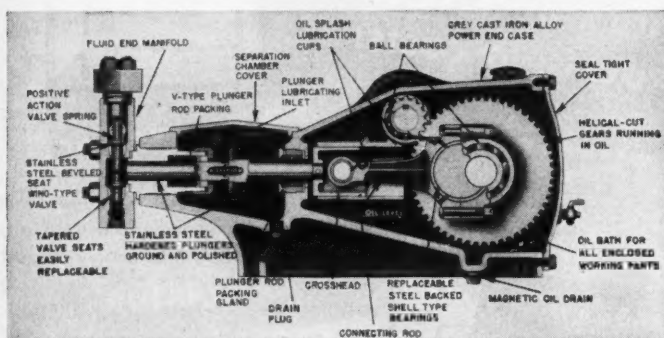
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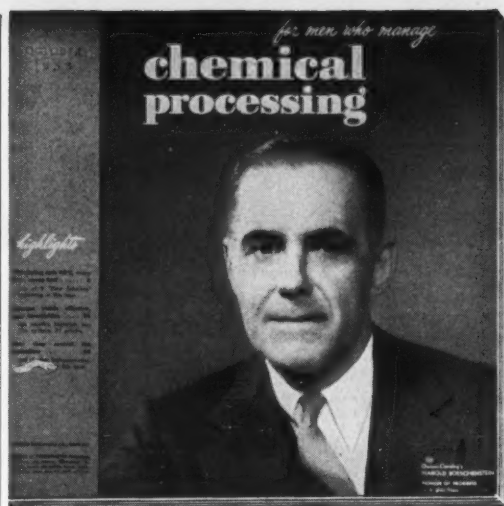
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"FLEX-TEF"

**Flexrock's Expansion Joints
Made of Solid Teflon* . . .**

**A BELLOWS PIPE SECTION THAT
EXPANDS . . . CONTRACTS . . . AB-
SORBS SHOCKS AND VIBRATION!**

Fabricated of chemically inert TEFLON*, these expansion joints are recommended for use against working pressures up to 25 P.S.I. and temperatures from minus 150° F. to plus 400° F.

FLEX-TEF Expansion Joints have outstanding dielectric and non-adhesive properties; all sizes are supplied with gasketed metal flanges drilled to 125 or 150 pound A.S.M.E. standard bolting or for glass piping. Yes, FLEX-TEF is the answer to piping problems.

A few reasons why:

- One-piece construction
- No danger of cracking or bursting
- Won't contaminate materials conveyed
- Chemically impervious
- Zero water absorption
- Wide temperature range
- Permanent flexibility
- Fits all standard pipe
- Corrects misalignment

THE PLUS FACTOR in FLEX-TEF Expansion Joints is to be found in the quality of the product . . . delivered when promised . . . moderately priced.

*DuPont Trade Mark for Tetrafluoroethylene resin

Mail Coupon for Bulletin and Prices

FLEXROCK COMPANY
3611 Filbert St., Phila. 1, Pa.
Please send Bulletin and Price Sheet on Flex-
rock's "FLEX-TEF", the new Expansion Joint
made of Teflon.

Name
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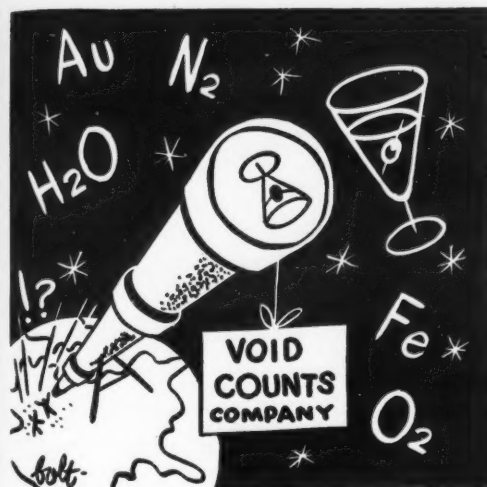


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CHEMICAL PROCESSING

**THAT'S
INTERESTING**



Chemical inventory of the universe

An extensive chemical inventory of the universe has been started by the astronomy department, University of California at Berkeley. Such diverse techniques as duplication of chemical reactions of stars in the laboratory are being employed. The astrophysicists have estimated, roughly, that the universe contains about 1000 parts hydrogen to one part of all other elements combined. Therefore, heavy elements exist only as a trace when the universe as a whole is considered.

Insufficient insulation

Some 21,000,000 homes in the US need insulation, according to a report by the Zonolite Company of Chicago, vermiculite processors. This figure is based on Government reports showing 75% of homes built prior to World War II and 25% built afterwards are either improperly insulated or have no insulation at all.

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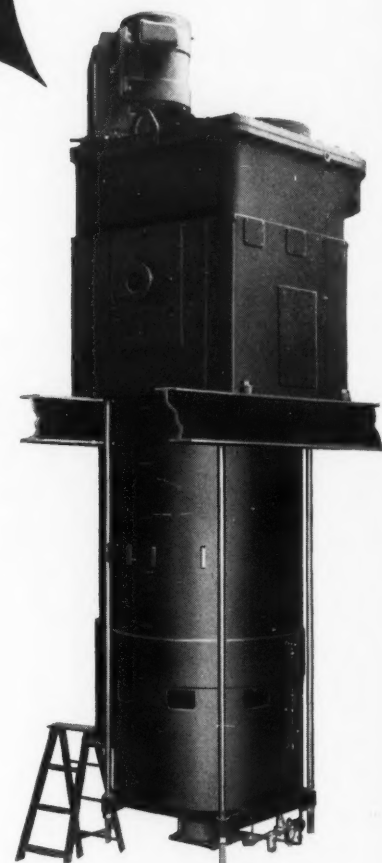
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